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Carleen O'Loughlin	237	Problems in the Economic Development of Antigua
G. E. Cumper	278	Labour & Development in the West Indies — Part I
D. T. Edwards	306	An Economic View of Jamaican Agriculture
Douglas Hall	340	Incalculability as a Feature of Sugar Production during the Eighteenth Century
Lloyd Best and Alister McIntyre	353	A First Appraisal of Monetary Management in Jamaica
A. W. Singham	364	Politics of the Developing Areas

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY COLLEGE OF THE WEST INDIES, JAMAICA, W.I.

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Problems In The Economic Development of Antigua[a]

By

Carleen O'Loughlin

I. Structure and Change in the Economy

The period reviewed in this study covers the years 1957-60, and during this period it is gratifying to note that the advances made in economic conditions during 1955-1956 were continued and, in some sectors, accelerated.

Progress was not however even throughout the period. In 1958, the economy was set back by a poor sugar crop, and in spite of this being partially compensated by a good cotton crop, the fall in sugar income was only just offset by increases in other sectors, so that the gross domestic product showed no increase between 1957 and 1958.

Whilst this underlines the continued dependence of the Antigua economy on sugar, one can also point to the brighter side. In the early 1950's any significant decline in sugar production would inevitably have caused an absolute decline in the national income. Although the 1958 crop was not quite so disastrous as that of 1954, it was sufficiently low to have caused an absolute decline in income in the Territory, had the conditions of 1954 still prevailed. This, however, should not be interpreted as suggesting that the sugar industry is of any less importance to the well-being of the economy because of developments in other sectors. On the contrary, any reduction in the sugar industry will lead to a greater dependence on Antigua's only other major industry – tourism, and a return to the problems of the "single industry" economy, from which Antigua is gradually freeing herself.

Sectors which show the most marked increases include construction, distribution, transport, catering and entertainment. The averages for sugar were also better for the years 1956-59 than for the years 1953-56. The number of tourist hotels increased from three to eight between 1957-60 and several more are under construction and projected. Visitors increased from 8,319 in 1956 to 16,605 in 1959. These figures underline the reason for increases in the sectors mentioned.

Whilst Antigua's natural advantages and the businesslike attitude of government and people to tourist development have contributed to the expansion of tourism, perhaps the one single factor which has been of greatest importance is the existence of an airport of international status in the Terri-

[a] Much of the work incorporated in this study was done whilst the author was employed by the Federal Government of the West Indies. The opinions expressed are those of the author but she acknowledges co-operation given by the Federal Government and Government of Antigua.

tory. This airport has done more than anything to put Antigua "on the map" and other developments have followed from this. More than anything, this fact perhaps emphasizes the enormous advantages of good communications to any small Territory.

The estimated gross domestic product per head in Antigua has, in the past three years, just exceeded that of St. Kitts-Nevis-Anguilla, and at $333 per head in 1958, is well above that of Montserrat and the Windward Islands; however, it was still substantially below Barbados ($474), Jamaica ($596), and Trinidad ($851).[1] Although the rate of growth of the gross domestic product has been greater in Antigua than in other smaller Territories, it has not exceeded the growth rate of Jamaica and Trinidad, and in spite of increased income in Antigua the gap between its living standards and those of the larger Territories has widened rather than decreased. This is, of course, due mainly to the greater rate of capital formation in the larger Territories.

In the national income report of Antigua prepared by the University College of the West Indies in 1958,[2] attention was drawn to several underlying disequilibria in the economy, which it was felt were not necessarily self-righting. The main problems were: high cost of importation and the limited range of consumer goods; shortage and high cost of locally-produced fresh foods, and the instability of the sugar industry. These problems will be discussed again in the light of the statistics presented in this recent survey. In addition, it is felt that three other problems should be discussed as having importance for the future of the growth of income in the island. The first is the tendency for high-rate tourism (rather than a mixture of middle-rate and high-rate tourism) to prevail in the island, the second is the need for diversification of the economy, and the third, the problem of balancing the budget.

High importing costs are mainly, but not wholly due to the lack of deep water harbour facilities and the expensive system of lighterage which exists. A deep water harbour is thus considered a priority amongst capital needs. At present estimates of construction costs, although a deep water harbour can be shown to be a self liquidating scheme, given a rate of interest below the market rate and sufficient time for repayment,[3] the servicing of such a debt would not permit of a decrease in the cost of importing for some considerable time. Thus in order for a deep water harbour actually to decrease importing costs in the immediate future, the major part of the cost of its construction would need to be met from a free grant. Offloading costs could then be reduced by half or less and the Government could still make a certain revenue if it were deemed desirable.

There is still much evidence that shops in Antigua do not stock a wide

[1] W.I. dollars are used throughout this article.

[2] O'Loughlin, C. "The Economy of Antigua," *Social and Economic Studies* Vol. 8, No. 3. 1959. University College of the West Indies, Jamaica.

[3] O'Loughlin, C. *The Economic Feasibility of a Deep Water Harbour in St. John's, Antigua.* The Federal Government of the West Indies. (cyclo-styled report), 1960.

range of goods which could be classed as "lower-income-group luxuries". This means that any expansion in the incomes of local residents is not necessarily matched by expansion in local expenditure. This does not help development. To begin with, people tend to put leisure before work if the money they earn cannot be spent on new and attractive acquisitions after the main needs of life are met, and secondly, people tend to favour emigration to a country where, not only can they earn more money, but the range of uses for money is much wider.

Some improvement is, however, noted in the range of stock carried by local stores since 1958, and in particular goods which are used both by visitors and residents, such as textiles and shoes, are well in evidence. It is probable that the increased electrification of the island, now under way, will bring with it an expansion of demand for consumer durables such as electrical appliances. The availability of electricity can be a major incentive to the improvement of homes, which brings with it a desire to obtain and keep a good regular job, the strengthening of home ties, and a deterrent to emigration. Thus any facilities for consumer credit, which can be provided at reasonable rates for wiring homes and purchasing appliances, should be considered as progressive and in keeping with economic development.

The lag between increased income and increased expenditure also reacts unfavourably on the receipts from import duties. This has been evidenced in the last few years by the fact that the actual yields from import duties have persistently fallen below the estimated yields. Here again, an increase in the use of electrical appliances could contribute a useful increment to import duties.

The second problem which has been listed, that of high prices, scarcity, and poor quality of locally produced fresh foods is one which, if anything, is growing worse. Although there is some evidence that growers are increasing their output of such goods as eggs, milk and green vegetables, the increase has not kept up with the increase in demand and is almost wholly aimed at providing for hotels and visitors. The quality of the produce is such, however, that hotels are increasingly seeking other sources of foodstuffs and the practice of flying in fresh foods from America and elsewhere is growing. The needs of the local population are not being fully met by production of fresh foods; and the high prices of such commodities, whether produced in Antigua or in nearby islands, creates real hardship to those who do not have land. The position is alleviated somewhat by the fact that many of the poorer people in Antigua do have access to land.

When there is a large and expanding tourist industry in an island, the local production of fresh foods should be a buoyant and expanding industry. The existence of visitors makes possible a larger scale of production than that constituted in the size of the local market only, and on this scale, improved methods may give very worthwhile returns. Any increase in the "local" content of tourist expenditure moreover means an increased con-

tribution by tourism to the national income. The low rainfall in Antigua is one of the biggest drawbacks to agricultural advance, and unfortunately existing surveys, whilst proving sufficient water for domestic use, do not, as yet, prove sufficient water for large-scale irrigation. The intensive production of vegetables however, gives a very high yield per acre and it is quite probable that the intensive cultivation of from twenty to fifty acres would yield sufficient to meet the normal needs of the town population and the visitors; and would yield a better quality product at a lower price. A development of this kind would have an immediate effect in lowering the cost of living; and although there might be complaints from some quarters that such competition harms the poorer local producers who cannot afford irrigation, it must be noted that no industry can expand on the basis of a high-cost inferior product. It must contract, since, sooner or later, the consumer will find it cheaper to import foods – whether fresh, canned or frozen. If scientific cultivation of foods was successful in Antigua, the boot may well be on the other foot, eventually. With good air communications, Antigua is in a strong position to export foods – for instance early spring vegetables – to temperate countries. There is no reason why a vegetable scheme should not be worked into the present system of peasant cultivation, although supervision would be necessary in the initial stages. Sufficient cold storage would be a necessary complement to such a scheme.

Most of the remarks made above also apply to meat. The high cost of fresh meat is a very serious hardship to local residents and makes it necessary for all meat used by hotels to be imported. The expansion of the meat industry can come about only by virtue of an incentive pricing policy and the improvement of pastures. Here again irrigation may be considered as a desirable objective and cold storage would have to be provided to complement an expansion in this industry.

Although it is probable that small-scale production of vegetables by scientific methods may be possible, utilizing known water supplies (possibly water could be transported by road if the pressure on site water was too great), the above remarks lead to the conclusion that further examination of the island's water resources should be considered a priority when development funds are being sought. Not only is this necessary for the sake of the agricultural and livestock industries, but also when considering any substantial increase in hotel or industrial growth. Modern industries such as oil refineries, breweries, food processing and others utilize considerable water. An excellent geological survey of the water resources of the island already exists and it is probable that further preliminary work will give more emphasis to the engineering and hydraulic problems.

The trends for livestock and crop production shown in Tables 6 and 8 show no significant increase in these sectors and this bears out the points made above that the economy is tending to become more dependent on imported foods. The figures for these sectors are however not of the highest reliability.

A third problem which merits particular attention is that of the sugar industry in Antigua. This is a broad subject and it is impossible to expand on it here. A commission which sat early in 1960[4], reported in some detail on the cost and price structure and conditions of cane payment. This needs to be followed up with an examination of the future position of the sugar industry in a developing and more diversified economy. Broadly, the problems of the sugar industry are as follows: (a) poor soil conditions and low rainfall make yields lower and fluctuations greater than in most other sugar islands; (b) following from this, profitability is low on average, and in bad years losses are experienced; (c) increased opportunities for employment make cane-cutting a less desirable occupation, and are also potentially a threat to the cultivation of cane by peasants.

Because the sugar industry will continue to be vital to Antigua's economic welfare for some years ahead, it is of some importance that these problems be considered in technical and financial terms; and that all sections of the industry be given the opportunity to discuss and formulate plans for the future. A successful effort to increase the production somewhat without increasing average costs would probably put the industry on a sounder footing; even if the increase was a small one, resulting in an average yield of 28-30 thousand tons over a period of five years, as against the 26 thousand tons over the past five-year period.

Owing to the high fluctuations in the sugar crop, the figures do not yet show a definite trend that sugar is becoming a decreasing proportion of the gross domestic product, but following the development of the other sectors, it is expected that this will show up in the next few years.

The next basic economic problem, which has become marked in the last few years, is the fact that the growth of tourism, now the island's second industry, has been of a rather unbalanced nature, emphasizing mainly the high-rate or highest-rate branches of the trade. At the present time, to criticize high-rate tourism may appear rather like looking a gift-horse in the mouth, but it is highly important that the future utilization of Antigua's natural tourist facilities be considered carefully. Otherwise, it may well happen that the physical limits of expansion are reached at an unnecessarily low rate of return in terms of income to the community. Even in Antigua, white sand beach, for instance, is a scarce resource in the long run. Therefore, one has to consider returns in the form of income per acre of beach from different forms of tourism, in much the same way as a farmer might consider returns in income per acre of farmland from different crops. As regards tourism, however, it is likely that a diversity of high and medium-rate would make for the most stability of the industry; with certain areas specializing in one type and other areas in the other. The future for low-rate tourist attractions is probably not very extensive, owing to the smallness of the local

[4]Rottenberg, S. *Report on the Sugar Industry of Antigua.* Government Printer, Antigua, W.I., 1960.

market. It is hoped however that facilities will eventually develop on some of the public beaches which are available to poorer people, both local residents and those from nearby islands.

At the moment there is some risk that all natural facilities will be taken up by high-rate tourism before medium rate tourism has had a chance to develop. There are certain dangers in this:

(a) Most high-rate tourists are Americans. A recession or rumoured recession in the United States could seriously reduce earnings. This has already been experienced in Jamaica in 1956. Middle-income tourists are more widely distributed between North America, Latin America and other West Indies. Thus the risk is spread.

(b) High income tourists are notoriously fickle. Antigua may be the fashion one year, Hawaii the next. The Mediterranean tourist regions are periodically hit by such whims of fashion. This does not of course apply to the long-staying tourist with property in the Territory.

(c) If beach land is limited, it is almost certain that middle-income tourism will give a greater return in income per acre than high-income tourism. This is not necessarily so where certain other facilities, such as yachting, are provided, but may be true in general.

To examine these questions more thoroughly a plan, on "town and country planning" lines is required. Such a plan should recommend methods of utilization of all land with potentialities for tourism and examine the economic factors involved. It must be emphasized however, that a plan of this nature can only be a guide, and should not be rigidly enforced in detail, since sometimes a good business opportunity arises for the utilization of land which may not have been foreseen in the plan.

The construction of a low-cost middle-income housing site (such as is found for instance at Mona Heights in Jamaica) on or near a resort area, would facilitate the development of middle-income tourism and might incidentally help to relieve the local housing shortage. There are a number of firms which both construct and finance such schemes, and enable the houses to be purchased through mortgages. Such a scheme might actually be sponsored by the Government but no actual outlay from the Government is envisaged. Besides encouraging middle-income tourism, and alleviating the local middle-income housing shortage, such a scheme would provide a good investment opportunity for the local investor.

A further problem listed – the need for diversification of the economy – can only be discussed in general terms. It is unlikely that Antigua can procure a great variety of different industries, because of the smallness of her own market and high freight costs to other parts of the Federation. A small country can moreover – almost always – become richer by specializing in a few main industries rather than having a number of small ones. The latter should, however, be given every encouragement, and the recent efforts of the Industrial Development Board in establishing a few minor industries are worthy of note.

In spite of the problems associated with attracting industries to small islands, Antigua's outlook, in this respect, is not entirely bleak. There are possibilities that certain light industries, producing for the Federal Customs Union area, may be attracted to Territories where communications can be shown to be good, living conditions pleasant, and where Government and people have a businesslike attitude. With the international airport, Antigua is already half on the way to being "on the map" and, if the deep-water harbour materializes, Antigua will have much to commend it as a site for light industries. Incentive legislation already exists for pioneer industries and a further attraction might result from the laying out of industrial sites with amenities. On the whole, however, it is felt that, rather than lay out sites in advance of industries turning up (if they do) it is better for the government to have a stated policy that it will endeavour to take main services to the site of any new industry and assist in procuring sites. This policy, in fact, already tends to operate in the case of hotels, but it should perhaps be more clearly formulated if other industries are to be attracted.

Hotel construction projected by actual or potential investors approximates to 12 million dollars. Although not all these plans may come to fruit, it is reasonable to suppose that others will be formed and that the level of investment in construction will be high. The deep water harbour plan too will eventually involve construction of wharves, buildings, etc. Thus one industry which might well develop in Antigua, is the manufacture of building materials, including perhaps cement. Cement could be used locally and in nearby islands where construction is also likely to expand greatly and provide a good market, if it could be produced economically on this scale. If gypsum is not available locally it could be imported from Jamaica, but lime, which is the main component should be cheaply recoverable from stone or coral in Antigua.

Power and water are of course necessary for the expansion of industries. The problem of water has already been discussed. If several very heavy, water-using industries were to be sited in Antigua, it might eventually become economic to install a sea-water distillation plant, as in Aruba, but at the present time, or with any immediately foreseeable expansion this is unlikely to be economic, particularly if improvements in exploiting and conserving existing sources are carried out. Planning for the future of electricity supplies should however accompany any industrialization project. As the expansion of hotels and electrification of rural areas proceed, projections of future demand should be drawn up, and estimates made for the future capital needs of electricity. This may necessitate special surveys, but it is worth doing because the optimum use of present and future capacity can better be guaranteed if the expansion of electricity is geared to accompany increases in demand.

The final problem but by no means the least, is the problem of balancing the current budget: at a superficial glance it appears that Antigua, in spite

of encouraging increases in the gross domestic product and national income, is becoming more, not less, dependent on grant-in-aid. Such a conclusion needs, however to be well qualified before it can be accepted.

Antigua has been carrying out capital, or semi-capital expenditure from current revenues, and these expenditures have been a vital part of the expansion of the economy; in fact without them it is unlikely that the development of tourism would have been possible. These expenditures involved mainly the extension and improvement of existing facilities such as water, roads, electricity and telephones. The costs of these extensions and improvements have been increased by the fact that an "octopus" problem exists; that is to say that services must spread out in all directions from the central area, like the legs of an octopus, because hotels are being built or have been projected in all extremes of the island and are not concentrated in one area.

Thus in 1959 an estimated $900,000 was spent on items which could well be classified as capital items, and dependence for actual current revenues was only to the extent of approximately $300,000.

These captal items are however necessary for the expansion of the economy and are closely related to future current revenues, in that they have a strong influence on increasing incomes and therefore the yield from direct and indirect taxation. The future financial independence of the Territory is thus closely linked with a continuation and, if possible, an acceleration of capital expenditure.

Projections of the gross domestic product, indicate that with a continuation of the rate of growth experienced during the period 1956-1960, the gross domestic product should stand at approximately 34.5 million by 1969. If we assume that customs revenues will be 10.5 per cent of GDP, internal revenue 8.2 per cent of GDP and other true revenue 7.2 per cent of GDP, a local revenue yield of $8.9 million should be received. This would be adequate for the government to balance its budget at approximately the same level of expenditure as at present, including present capital outlays; but would permit of no increase in any current items of expenditure. Development however often brings with it demands on current as well as capital expenditure such as an increased need for information and statistical services, increased agricultural services and in particular, perhaps an increased emphasis on the educational attainments necessary in an expanding and diversifying economy. Although Antigua can look forward to being financially viable, therefore, this position will not be reached without difficulty, unless the growth in gross domestic product and therefore of Government revenue, is actually above that of the period 1956-1960.

This can occur if the rate of capital formation is substantially increased and if the projected hotel building and other construction materializes, it may well happen that private investment is accelerated. Certainly an increase in public capital expenditure such as is envisaged in the deep water harbour project, the improvement of utilities and electricity expansion should bring about an increase in income above that experienced in the past five years.

Whilst it is not foreseen that Antigua will rely indefinitely on foreign capital inflows, it is clear that what is really needed is an acceleration of foreign capital inflows in order for economic viability to be reached, and a continuation of such inflows over a further period, in order to establish such viability. Thereafter the public capital inflows would have to be tailed off gradually, so that self-generated expansion would, in any one year, exceed the reduction in public capital formations. An outline of some capital needs of Antigua during a ten-year period is contained in Section II.

Assuming little or no expansion in the rate of capital formation, it will be exceedingly difficult for Antigua to reach a position of financial viability by 1969, and although it is possible, it can virtually only be achieved by a freeze in government expenditure. The only other way in which the position might be relieved, assuming the same rate of increase in national income as has taken place in the last four years, would be to increase the incidence of taxation or raise the government's share in the national income.

Revenues can increase because incomes increase and thus yields from direct and indirect taxes are higher; or they can increase because a higher *rate* of tax on given incomes is introduced, or because of a mixture of both. In our projections we have, in general, concluded only that the yield of revenue will increase *pari passu* with the increase in income, with the slight modification that direct taxes will increase at a slightly higher rate than G.D.P. owing to the effects of progressive taxation; and we have assumed that indirect taxes increase slightly following the tightening up and improvement of customs collection, but that indirect taxes do not at any time rise above 10.5 per cent of the gross domestic product. These assumptions are based on the conclusion that increases in taxation in Antigua can only be of a marginal nature.

Government is expensive in a small Territory because many of the economies of scale possible in a larger Territory are absent. In all the islands of the Leeward and Windward Territories the proportion of gross domestic product going to government is high as compared with countries of similar stages of growth; and of all these Territories it is highest in St. Kitts and Antigua even when we exclude from gross revenue the self-balancing items of the Peasant Development Office.

In these two Territories, government true revenue is approximately 23 per cent of gross domestic product as compared with an average of between 15 per cent – 18 per cent which is generally found to prevail in such underdeveloped countries as Ghana, Malaya, Mauritius, Fiji and British Guiana. In spite of the known limitations on the figures of gross domestic product, this comparison between the gross domestic product and true revenue is the only safe method by which the tax burden can be compared between one country and another. The method of comparing revenue per head of population as between various Territories, which is sometimes used, is only permissible where the gross domestic product per head is the same. Even in

the present method, certain qualifications must be introduced. Owing to the effect of progressive taxation, for instance, government revenue at 20 per cent of the gross domestic product constitutes a heavier tax burden on a poor country than on a richer one.

It does not seem that indirect taxes can rise very much above 10.5 per cent of the gross domestic product, as this is a high proportion for a country at Antigua's stage of development and can be compared with Trinidad — 3.8 per cent in 1958 (or 4.3 per cent if we include excise duties on oil) and 5.1 per cent in Jamaica in 1958, the difference being partly due to the fact that Antigua is more dependent on imports. On a per head basis there is very little difference as between indirect taxes raised in the various Territories but here again, such a comparison would only be valid if the incomes per head were comparable. It thus seems that increases in indirect taxes in Antigua will be of a marginal nature, and no substantial increase in this revenue can be expected, except in so far as national expenditure increases as national income rises.

The future of direct taxation yields is more difficult to predict. A country with an uneven distribution of income will always tend to produce a higher yield of direct taxation than a country with an even distribution of income, unless the latter is a much wealthier country. On the other hand the existence of a few profitable companies or large businesses can soon bring up the yield even if, basically, the distribution of income has not changed very much.

In Antigua, in the past, nearly all the income tax has been paid by the sugar companies, and the yield was entirely dependent on the sugar crop. This position is altering, but owing to the tax holidays given to hotels, the yield from direct taxation has not yet increased by as much as might be expected from recent income increases. It is expected, however, that yields of direct taxation will increase sharply as more hotels end their tax holidays, and, in the projections in Table 1, it is estimated that the yield will increase at a greater rate than the increase in gross domestic product. There is little doubt that a large number of small taxpayers can also be brought into the net, but the fact that many people in Antigua have more than one source of income, makes tax collection difficult. In Jamaica in 1958 the yield from direct taxes equalled 5.1 per cent of gross domestic product and in Trinidad 9.1 per cent. Thus in projecting an increase of yield in Antigua from 6 per cent in 1960 to 8.4 per cent in 1969, we have been fairly conservative. The incidence of direct taxation is fairly high in Antigua and tax rates on individuals are greater than those, for instance, in Trinidad.

All in all then, we must conclude that the yield from indirect and direct taxation will increase *pari passu* with the increases in gross domestic product except that there will be a slightly more than proportionate rise in the yield from direct taxation. As far as the *incidence* of taxation is concerned, however, adjustments of a marginal nature only, are likely to be possible without causing disincentives to work and investment.

TABLE 1. PROJECTIONS OF GROSS DOMESTIC PRODUCT AND GOVERNMENT REVENUE BASED ON PRESENT RATES OF CAPITAL FORMATION AND INCOME GROWTH

$ million

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
			Estimates			Provisional Estimates				Projections					
Gross domestic product at factor cost	12.4	15.9	18.1	18.0	20.9	21.3	23.5	24.0	25.0	26.5	28.0	30.0	31.5	32.9	34.5
Revenue in $ million															
Customs	1.3	1.5	1.6	1.7	2.0	2.1	2.4	2.4	2.6	2.9	2.9	3.2	3.3	3.5	3.6
Inland revenue	.4	.5	.6	1.1	1.1	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.5	2.7	2.9
Other true revenue	.4	.7	.9	1.2	1.4	1.6	1.7	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.4
Total	2.1	2.7	3.1	4.0	4.5	4.9	5.5	5.7	6.2	6.8	7.2	7.8	8.1	8.6	8.9
Revenue as % of G.D.P.															
Customs	10.4	9.4	8.8	9.4	9.6	9.9	10.2	10.0	10.4	10.9	10.3	10.7	10.5	10.6	10.4
Inland revenue	3.2	3.2	3.3	6.1	5.2	5.6	5.9	6.6	7.2	7.5	8.0	8.0	7.9	8.2	8.4
Other true revenue	3.2	4.4	4.9	6.7	6.7	7.5	7.2	7.1	7.2	7.2	7.5	7.3	7.3	7.3	7.0
Total local revenue as % of G.D.P.	16.8	17.0	17.0	22.2	21.5	23.0	23.3	23.7	24.8	25.6	25.8	26.0	25.7	26.1	25.8

Under the head "other true revenue" a variety of receipts are earned by government departments such as post office, telephones, hospitals, electricity, ice, and cold storage and airport. Although these are expected to increase, they are not expected to increase more proportionately than national income, unless of course such government activities are greatly expanded.

The result of these estimates and projections is then, that, given a continuation of the present rate of growth of the gross domestic product, the government may expect to raise approximately $8.9 million in local revenue by 1969. This is only sufficient to cover government expenditure at present levels, including the extension and improvement of main services (including roads) at present levels. It is not sufficient to pay for the extension of social services and the administrative and educational needs which might become necessary in a developing economy. It must however be remembered that these projections of gross domestic product are based on the existing rate of capital formation. If there could be a substantial stepping up of private and public capital formation in the next few years, a much higher rate of growth in gross domestic product is to be expected and the economy could become financially viable and sustain its financial autonomy, given a continuation of the present favourable development conditions. In common with other West Indian Territories, Antigua has hopes of obtaining external assistance for capital development. In the next section, therefore, projections are drawn up based on an accelerated capital formation programme.

II. Capital Needs

Capital formation for the years 1953-59 is shown in Table 2. This indicates that there has been a marked increase in capital formation, and this has been due both to private and to public investment.

TABLE 2. Capital Formation 1953-59

$000

	1953	1954	1955	1956	1957	1958	1959
Private fixed capital formation	821.6	1,424.8	1,636.1	1,694.9	2,678.6	3,172.6	2,932.0
As % of G.D.P.	6.8	13.3	13.2	10.6	14.8	17.6	14.0
Public fixed capital formation	581.2	749.4	556.3	865.6	980.4	1,100.9	1,541.2
As % of G.D.P.	4.8	7.0	4.5	5.4	5.4	6.1	7.4
Total fixed capital formation	1,402.8	2,174.2	2,192.4	2,560.5	3,659.0	4,273.5	4,473.2
As % of G.D.P.	11.6	20.3	17.7	16.1	20.2	23.7	21.4
Changes in stocks	220.0	—259.3	—170.5	—281.2	—442.5	503.0	529.5
Total capital formation	1,622.8	1,914.9	2,021.9	2,279.3	3,216.5	4,776.5	5,002.7

Total fixed capital formation was a fairly high proportion of G.D.P. during the period 1957-59, when compared with the proportion in many other countries. It must however be remembered that a country's capital requirements depend to some extent on its capital stock. In a capital-starved economy

like Antigua, a rate of capital formation of 20 per cent of gross domestic product may be sufficient to ensure some growth, but it needs more than this to make up for the lack of capital investment in the past and to set the country on a sound economic footing in which it can ultimately be independent of foreign aid. It was shown in Section I that a position of economic viability could be reached by 1969, given a continuation of present rates of capital formation and income growth, but that this would only be reached with difficulty and might not easily be sustained. What is needed therefore is an acceleration of the rate of capital formation, rising to the point where it equals approximately 33 per cent of gross domestic product. Once Antigua has reached a level of *per capita* income approaching that of, say, Jamaica, it may be possible to relax this accelerated capital formation until it falls to about 25 per cent of gross domestic product (which is approximately the present rate in Trinidad and Jamaica). It is evident however, that if the gap in living standards between the richer and poorer Territories is to be narrowed, the poorer Territories will require a much higher rate of capital formation than that prevailing in the wealthier Territories. The following tables and notes therefore set out an accelerated capital programme for Antigua for the period 1962-69.

TABLE 3. Required Fixed Capital Formation and Income Growth Under Accelerated Programme

$ Million

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Projections of G.D.P. at present rate of capital formation as in Table 1.	20.9	21.3	23.5	24.0	25.0	26.5	28.0	30.0	31.5	32.9	34.5
Projections of G.D.P. under accelerated capital programme.	20.9	21.3	23.5	25.4	27.0	29.1	31.4	33.9	36.6	39.5	42.7
Projections of private fixed capital formation	2.9	3.0	3.5	3.8	4.2	4.5	5.0	5.5	6.0	6.2	7.0
Projections of public fixed capital formation (accelerated)	1.5	1.8	2.5	3.5	4.0	4.5	5.7	4.0	4.4	4.0	4.2
Total fixed capital formation under accelerated formation	4.4	4.8	6.0	7.3	8.2	9.0	10.7	9.5	10.4	10.2	11.2
% of G.D.P.	21.1	22.5	25.5	28.7	30.4	30.9	34.1	28.0	28.4	25.8	26.2

Under these projections the public capital formation needs of Antigua will be approximately $34 m. between 1962 and 1970. It must however be noted

that the projected increases in gross domestic product are much greater, under the assumption of an increased capital programme, than are those given in the projections in Table 1 which are based on the assumption of a continuation of the present capital programme. Under the accelerated programme a position of economic viability would be reached by approximately 1966, and at that point, the government should be able to bear all recurrent expenditure and a continuation of approximately the present capital expenditure, without recourse to grant-in-aid. Thereafter government would not only be able to step up capital formation from its own funds, but would also be able to increase the public debt.

In Table 4 estimates of capital needs are set out under some main projects. Other projects may be considered necessary and further investigation may lead to amendment in the amounts shown under each project. Thus the table is considered as provisional. All capital borrowed is assumed to pay market rates of interest. If low interest loans become available adjustments as between grant needs and loan needs ought to be made.

The need for substantial grants, in order that the above position might be reached, falls therefore in the period 1962-1966. Some of the capital projects which are highly desirable for the economic expansion of Antigua are listed below:

Deep Water Harbour. This is estimated to cost about 6 million dollars. Although it has been estimated that Antigua could finance about half this cost herself, by using income from the harbour to service the debt involved, this could only be done if no reduction in present landing costs were made.[5] It is therefore desirable that at least three-quarters of the cost be met by a grant and the remaning $1.5 million only, raised by a self-liquidating loan. By 1968, it is estimated that it would be possible to raise a further one million loan for extension on a self-liquidating basis, if increases in traffic warrant it.

Extension and Improvement of Mains, Services and Roads. This is expected to run at approximately $1.5 million per annum. It would gradually be taken over by local revenues, until by 1967, the total should be met from local revenues. This is of course based on the higher projections resulting from an increased capital programme, not the lower projections based on the present capital programme as in Table 1.

Increase of Electricity Capacity. It should be possible to undertake this on the basis of a self-liquidating loan up to about $2.5 million after 1966.

Telephones: A new exchange is needed. This item could be mainly or partly self-liquidating.

Sewerage: This is an immediate need and can only be achieved with external aid. It is estimated at $3.0 million in expenditure during the period 1963 and 1964.

[5] O'Loughlin, 1960.

TABLE 4. ESTIMATES OF PUBLIC CAPITAL FORMATION REQUIRED UNDER ACCELERATED CAPITAL PROGRAMME. $ Million

	1962	1963	1964	1965	1966	1967	1968	1969	Total
1. Capital which should become available from local revenue under accelerated programme									
a) Extension of mains, services and roads		.2	.5	.8	1.0	1.3	1.5	1.5	6.8
b) Technical education							.1	.2	.3
c) Social services							.1	.2	.3
Total		.2	.5	.8	1.0	1.3	1.7	1.9	7.4
2. Capital which could be raised by loans of a self-liquidating nature									
a) Deep water harbour				1.5					1.5
b) Extension to deep water harbour							.5	.5	1.0
c) Electricity capacity					1.3	1.2			2.5
d) New telephone system			.5	.5					1.0
Total			.5	2.0	1.3	1.2	.5	.5	6.0
3. Capital which could be raised by government borrowing									
a) Water, irrigation, agriculture							.5	.5	1.0
b) Beach and tourist facilities						.5	.2	.3	1.0
Total						.5	.7	.8	2.0
4. Capital for which grants are required									
a) Deep water harbour	1.5	1.5	1.5						4.5
b) Extension of mains, services and roads	1.5	1.3	1.0	.7	.5	.2			5.2
c) Water, irrigation, agriculture				1.0	.5	.5	.5	.5	3.0
d) Social services				.5	.5	.5	.5	.5	2.5
e) Technical education				.2	.2	.2	.1		.7
f) Sewerage	.5	1.0	1.0	.5					3.0
	3.5	3.8	3.5	2.9	1.7	1.4	1.1	1.0	18.9
Total Public Capital Formation	3.5	4.0	4.5	5.7	4.0	4.4	4.0	4.2	34.3

[5]O'Loughlin, 1960.

Research and Improvement of Water Supplies, Irrigation and Agriculture. Although early attention is needed to this problem, it is suggested that it should be deferred until after the deep water harbour, to enable a phasing of expenditure to take place. The total cost is estimated at $4 million between 1966-1970 of which $2 million could be raised by an increase in the public debt. This is a project which should have a fairly immediate impact on incomes. Pilot projects in irrigation should be started early.

Technical Education. Expansion of a technical centre and possibly a hotel school will be an urgent need to complement the development of the island.

Social Services. These will become more necessary to meet increases in population and provide certain basic facilities for visitors. Primary and secondary education is included. The figure given is only a provisional estimate. Targets should be set and the capital and recurrent costs should be worked out.

Beach and Tourist Facilities. If the number of hotels increases significantly, some may be situated inland. Changing rooms and facilities on beaches may be required, both for visitors and residents: beach protection and small boat facilities may also have to be expanded to encourage growth of tourism. Public parks and gardens and the planting of ornamental trees are also considered a necessity.

Contractor Financed Schemes. Besides the above schemes which would be financed through government, other semi-public schemes might be sponsored by government but really come under the head of private capital formation. For instance if a new town including low and middle-income tourist facilities was to be built, it is considered that this, in the main, would be contractor-financed.

The above projections are not considered to be a rigid plan. Other projects might prove to be more necessary than those listed. It is however a start in estimating the capital needs of the Territory.

Financing of Programme

The projections of income in the accelerated programme are, of course, directly related to the capital formation itself. The suggested methods of financing the development all stand or fall together. In other words, if the grants desired in 1962-65 do not materialize, the amounts projected as being available from government current funds are not likely to materialize either; and the ability of the government to borrow may be reduced. Thus the whole programme is really based on the availability of capital grants of the magnitude specified, during the period 1962-65.

The Income Effect of the Schemes

Development projects add to the gross domestic product in a number of ways. Firstly, there is the actual addition to factor incomes, resulting from expenditure on the projects at the construction stage. This can be derived approximately from rough costing estimates for the various schemes. At the

construction stage, the projects listed in Table 4 are estimated to add to the G.D.P. annual amounts as follows, in millions of W.I. dollars:

1962 = 1.8, 1963 = 1.9, 1964 = 1.9, 1965 = 2.2, 1966 = 1.9, 1967 = 1.9, 1968 = 1.5, 1969 = 1.4.

Secondly there is an addition to gross domestic product, because expenditure out of the above incomes generates some additional factor income. To gain an approximate figure of this, it is necessary to estimate the "factor income component" of consumer expenditure. In Antigua, where the propensity to import is high this is only about 30 per cent of household income; so that the income multiplier for the year 1963 would be equal to:

$$\frac{30}{100}\ 1.9 + \frac{30^2}{100^2}\ 1.9 + \frac{30^3}{100^3}\ 1.9$$

which approximates to an additional $814,000. Taking into account this income multiplier, then each of the above figures can be increased by approximately 43 per cent.

The third kind of income increases to be expected from capital investment projects are those which are not related to the expenditure at the construction stage, but are related to the use of the capital created. It is not possible to identify exact income increases of this kind although generalizations can be made about certain types of investment.

With regard to such investments as the deep-water harbour, electricity, telephone and water supplies, it is almost impossible to relate income growth to investment in such projects. We can say how much income may be earned in the operation of these services but this is likely to be a small part of the total income due to them. Indeed, in the case of the deep-water harbour, it may well be that in the initial years, the income earned in its operations will be less than under the old, less efficient system. Public utilities such as these, however, are essential to development, and even if we cannot say how much income increase is due to them, we can almost certainly say that growth of the national income would be impossible without them.

Other types of investment can be more nearly related to future income growth. If there is a land settlement scheme, for instance, geared to production of particular products, we can estimate approximately the effect on income. At prices slightly lower than those now prevailing, for instance, it is estimated that, under intensive methods of cultivation and irrigation, there would be an increment to G.D.P. of $15,000 per annum for each ten acres of land producing vegetables throughout the year for local use. To this must be added about 40 per cent for the indirect effects. It can also be estimated that approximately $10 is added to the G.D.P. for each tourist day, so that an addition of ten tourist beds, filled for one third of the year, will add $12,200 to the gross domestic product (*via* all types of tourist expenditure) plus another 40 per cent for indirect effects.

Thus whilst it is not possible to make projections of exact relationships

between income and investment, there are sufficient indicators to enable the effect on income of an accelerated investment programme to be gauged.

III. The Gross Domestic Product

Table 6 shows the gross domestic product, at factor cost, by industrial origin, for Antigua, for the years 1957, 1958 and 1959, and projections for 1960 and 1961.

These totals are simply the aggregates of all factor incomes earned in the various industries or sectors. They include salaries, wages, profit, interest and rent. Care must be taken not to confuse the factor incomes of each industry with the total value of its turnover, or its total revenue. For instance in "distribution and commerce" the turnover would be the total value of sales, whilst factor incomes would be the receipts in the form of wages, salaries, rents, interest and profit. The components of each sector in Table 2 and recent trends are discussed below.

1. *Sugar*

Sugar is still very important in Antigua's economy and accounted, on average, for 22 per cent of the gross domestic product in the three years 1957, 1958 and 1959. Its relative importance has not declined during the past three years, owing partly to the fact that the period 1957 to 1959 was better for sugar on average than the period 1954 to 1956. However, the acreage under sugar has not materially increased and as other sectors of the economy develop, it is to be expected that the importance of sugar in the economy will tend to decline. The importance of sugar is highlighted by the domestic product totals for 1958. In this year, owing to a poor sugar crop, there was no advance in the total product over 1957, in spite of advances in all other sectors, including an excellent cotton year. Thus the future development of the Territory still depends on maintaining a high level of sugar production.

Table 5 gives figures of quantities of cane and sugar produced in recent years, and from this it will be seen that fluctuations in production are very marked. Antigua is subject to a very variable and, on average, low rainfall, and this has reduced the reliability of sugar production. The annual average production for the years 1954-1959 was 26,300 tons and this period included three good years, two poor years and one very poor year. At this average, sugar is economic in Antigua, but the industry is marginal and a series of poor years could have serious effects on its ability to survive.

The factor income from sugar aggregated in Table 6 includes, not only wages, salaries, profit, rent and interest, but also the value of the export duties and contribution to the special funds. In a situation where a tax cannot be passed on to the consumer because the price is fixed, levies or duties of this kind are a tax on profit, and as profit is included in the gross domestic product before tax, the tax must be added back.

TABLE 5. PRODUCTION OF CANE AND MILLED SUGAR 1954-60

	1954	1955	1956	1957	1958	1959
Tons cane produced by:						
Estates	75,501	112,391	161,071	169,461	111,331	188,133
Peasants (P.D.O.)	18,296	36,292	63,792	62,931	48,611	57,696
Peasants (other)	11,174	23,168	43,423	33,708	25,985	26,672
Total	104,971	171,851	268,286	266,100	185,927	272,501
Tons of sugar produced	12,601	19,836	28,713	31,985	19,323	31,828

2. *The Cotton Industry*

Cotton is still the second most important crop although the outlook for sea-island cotton has not been particularly bright. In 1958 a high acreage was reaped and a good price was obtained for the product. This assisted the economy, and in particular the peasants, to tide over a poor sugar year. The spinners in Lancashire have, however, complained of heavy losses in holding the 1958 crop and the price fell abruptly in 1959 resulting in a shrinkage of acreage and reduction in income from this crop. Antigua was fortunate in 1960 in being able to dispose of her crop early, even if at a lower price, as other cotton producing Territories have had difficulties in selling the crop; although it is understood that the spinners are reluctant to hold the crop rather than to buy it.

TABLE 7. COTTON STATISTICS IN ANTIGUA.

	1954	1955	1956	1957	1958	1959
Acreage M.S. 1	2,860	4,506	4,962	2500	4,210	2,195
V.H. 8		733	996	775	874	577
V.H. 10					27	
Lint production (000 lb.)						
M.S. 1	291	991	947	373	1,098	378
V.H 8 & V.H. 10		276	301	153	265	—
Yield per acre clean lint (lb.)						
M.S. 1	N.A.	211	173	137	237	122
V.H. 8	N.A.	355	277	173	256	146
V.H. 10					272	
Price of clean lint (cents per lb.)						
M.S. 1	78-84	106-112	100-106	110-116	111-117	99-105
V.H. 8		118-124	112-118	122-128	123-129	110-116
V.H. 10					119	

3. *Other Agriculture and Livestock*

The data for this group are very scant, and for the time being all that can be done is to extrapolate over the previous totals, taking account of livestock slaughterings and other fragmentary information. A survey of agriculture in Antigua is now in progress and it is probable that improved estimates will be made in any future surveys.

4. *Processing and Manufacturing*

The details for sugar milling and cotton ginning are included in the figures for sugar and cotton. Besides these main processing industries, there are a

TABLE 6. Gross Domestic Product at Factor Cost 1956-1961 $000

	Estimates 1956	%	Estimates 1957	%	Estimates 1958	%	Provisional Estimates 1959	%	Very Provisional Estimates 1960	%	Projections 1961	%
Sugar	3,089.1	19.4	4,589.7	25.4	3,244.0	17.9	4,895.4	23.4	3,800.0	17.8	4,600.0	19.6
Cotton	790.4	4.9	318.9	1.8	1,132.8	6.3	255.9	1.2	300.0	1.4	300.0	1.3
Other crops	938.1	5.9	1,008.1	5.6	968.6	5.4	1,189.7	5.7	1,200.0	5.6	1,250.0	5.3
Livestock	840.7	5.3	980.0	5.4	957.0	5.3	1,060.3	5.1	1,100.0	5.2	1,150.0	4.9
Fishing	158.0	1.0	239.6	1.3	306.9	1.8	273.6	1.3	280.0	1.3	280.0	1.2
Manufacturing	91.0	.6	172.0	.9	185.7	1.0	190.6	.9	195.0	.9	200.0	.9
Construction and engineering	1,419.2	8.9	1,203.0	6.7	1,315.0	7.3	1,953.2	9.3	2,400.0	11.3	2,600.0	11.1
Distribution and finance	1,727.0	10.8	1,965.0	10.9	2,026.0	11.2	2,321.2	11.1	2,700.0	12.7	2,900.0	12.4
Transport and communications	578.0	3.6	563.0	3.1	675.0	3.7	801.0	3.8	820.0	3.9	850.0	3.6
Professions	460.0	2.9	450.0	2.5	455.2	2.5	463.6	2.2	470.0	2.2	485.0	2.1
Catering, entertainment services	1,681.6	10.5	2,100.0	11.6	2,277.7	12.6	2,422.2	11.6	2,650.0	12.5	2,850.0	12.1
Rent of dwellings	1,242.6	7.8	1,250.4	6.9	1,300.0	7.2	1,390.2	6.6	1,400.0	6.6	1,550.0	6.6
Government	2,934.3	18.4	3,245.1	17.9	3,184.0	17.8	3,725.7	17.8	3,950.0	18.6	4,450.0	18.9
Total	15,950.0	100.0	18,084.8	100.0	18,027.9	100.0	20,942.6	100.0	21,265.0	100.0	23,465.0	100.0

Note: Owing to severe drought in 1961, it is unlikely that the projections for sugar will be achieved.

TABLE 8. ESTIMATES OF VALUE OF PRODUCTION AND FACTOR INCOME FROM AGRICULTURE AND LIVESTOCK EXCLUDING COTTON AND SUGAR

$000

	1957	1958	1959
Total value of production crops	1,000.0	950.0	1,180.0
Livestock products	1,170.0	1,170.0	1,340.0
Firewood, timber, charcoal	80.0	80.0	80.0
Total	2,250.0	2,200.0	2,600.0
Factor incomes			
Crops	958.1	918.6	1,139.7
Livestock products	980.0	957.0	1,060.3
Firewood, timber, charcoal	50.0	50.0	50.0
Total factor incomes	1,988.1	1,925.6	2,250.0

number of smaller ones. There are establishments for the production of arrowroot starch, edible oil and cornmeal which are under the auspices of the Industrial Development Board and these, although small, have expanded and have shown a small surplus. There is also a pottery which is now in private hands. The manufacturing sector in Table 6 also includes such activities as the manufacture of ice, aerated water, baking, furniture making and tailoring.

Investors have not taken a great interest in developing manufacturing industries in Antigua up to now. Whilst the smallness of the internal market inhibits investment purely for local use, it is hoped that Antigua may get some light industries resulting from the expansion of industry in the West Indies after Customs Union. Although freight costs are always a disadvantage to a small island compared with a larger one, it is hoped that a deep water harbour will ultimately be built in Antigua. The international airport provides excellent communications and would favour the production of goods which can be transported by air. Antigua has available land, water, electricity and reasonable roads, sufficient at least to accommodate a number of small industries. Pioneer industry incentives are given and the environment of Antigua is progressive and favourable to development, due in part to the island having been put very much "on the map" by its good air-communications and constant stream of visitors.

5. *Construction and Engineering*

This sector includes all activities classified as fixed capital formation whether undertaken by government or private enterprise. In addition it includes engineering, repairs and maintenance of fixed capital assets. In Table 9 a breakdown of these activities is shown.

In the industry breakdown in Table 6 it should be noted that although government capital formation is included in construction and engineering, government engineering and building maintenance is included in the Government Current sector. Certain personal emoluments to officials who are concerned both in capital and current activities of government are also in-

TABLE 9. CAPITAL FORMATION, ENGINEERING AND MAINTENANCE

$000

	1957	1958	1959
Government fixed capital formation	980.4	1,100.9	1,541.2
Private fixed capital formation			
Residential buildings	680.0	781.7	625.2
Commercial buildings	420.7	668.6	650.8
Machinery and vehicles (excl. govt.)	1,474.4	1,571.5	1,583.5
Land development	103.5	150.8	72.5
Total fixed capital formation	3,659.0	4,273.5	4,473.2
Total value of engineering and building maintenance	650.3	675.6	692.8
Total value construction and engineering sector	4,309.3	4,949.1	5,166.0
Factor incomes, construction and engineering sector	1,203.0	1,315.0	1,953.2

cluded under Government Current. The sector account for saving and investment (Account 3) shows details of the sources of capital funds.

6. *Distribution and Finance*

This sector includes all commerce industries i.e. wholesale and retail distribution, agencies, banks and finance companies and real estate. It excludes accountants, surveyors, etc. who are included under professional services.

The distribution sector has increased quite considerably during the period, reflecting the increased income of the island. There is however, some evidence that the purchase of goods at the retail stage has not quite kept pace with the growth of income. Households are increasing their purchases direct from overseas and one suspects that the purchases of passages to the U.K. and other overseas countries is becoming a more important objective of household saving.

The factor incomes earned in distribution and finance increased from an estimated 1,727 thousand dollars in 1956 to an estimated 2,321 thousand dollars in 1959. Of this approximately 82 per cent is derived from retail and wholesale business and the remainder from banks, insurance, real estate, etc.

There has been an increase in credit facilities in the island due to the presence of a hire purchase company and receipts from insurance have gone up. The interest earnings of all financial intermediaries are estimated on average at 5.5 per cent of their deposit liabilities, in the absence of any better information.

7. *Transport and Communications*

This sector includes all road transport, locally owned shipping, stevedoring and lighterage (excluding yacht chartering which is included under sports and entertainment) and air transport and cable and wireless. Operation of the port and airport is included in government current expenditure. The contribution from air transport has increased considerably, not only because

of the development of a local airline but also because of increased staff of overseas airlines in the Territory. Road transport too has expanded and the growth in the number of commercial vehicles is shown in Table 10.

TABLE 10. NUMBERS OF COMMERCIAL ROAD VEHICLES REGISTERED

	1956	1957	1958	1959
Buses	23	24	24	47
Taxis	152	172	215	317
Tractors	129	153	164	183
Other commercial	267	379	500	552

The enormous expansion in taxis does not necessarily mean that income has increased in proportion. Each taxi is probably doing less business, as the number of taxis is tending to outstrip demands. Taxis are at least as expensive in Antigua, as in any other island and this has tended to restrict expansion of the demand. Not all vehicles registered as taxis are full-time taxis. It is quite common for private residents to register their car as a taxi and to hire it out on a self-drive basis to visitors.

The following table gives estimates of the gross domestic product attributable to each part of the transport sector.

TABLE 11. FACTOR INCOME FROM THE TRANSPORT AND COMMUNICATIONS SECTOR

$000

	1957	1958	1959
Road transport	190.0	235.0	289.6
Water, stevedoring etc.	253.0	262.0	285.6
Airlines and communications	120.0	178.0	225.8
	563.0	675.0	801.0

8. *Catering, Entertainment and Personal Service*

This sector includes hotels, restaurants, sport, entertainment, domestic service, hairdressing and other personal services. Its size in Antigua derives from the importance of tourism in the island.

Tourism is however a number of industries rather than one single industry. Its influence is shown in distribution and construction sectors as well as in the catering and entertainment sector. Details of tourist expenditure are, however, shown in this sector because this is where it is most important.

Table 12 gives an "account" for tourism, including expenditure by tourists in all sectors of the economy, but not including capital expenditure such as construction of tourist hotels. In Table 13 details are given of the components of the expenditure. It should be emphasized that these details are estimates based on a variety of data and are subject to revision if and when it becomes possible to undertake a direct enquiry into tourist expenditure. Table 14 shows the actual factor incomes earned directly from tourism with an estimate for indirect incomes generated by direct incomes. The total shows that tourism has probably contributed about 14 per cent of the gross domestic product of Antigua.

TABLE 12. TOURIST INDUSTRY ACCOUNT

$000

Receipts	1957	1958	1959	*Outlays*	1957	1958	1959
From overseas sector Tourist spending	3,495.4	4,140.0	5,285.5	Hotel bills, including bar, laundry, service charge, etc.	1,805.5	2,320.0	3,006.3
				Direct wages, including tips	250.0	275.6	298.2
				Transport, including taxis, hire cars, gasoline, service	401.2	430.0	558.0
				Sport and entertainment, including yachting, golf, cinemas, shows etc.	175.0	200.0	244.7
				Purchases from shops agencies etc.	750.0	775.4	986.8
				Services not specified hairdressing, dressmaking, business services etc.	113.7	139.0	191.5
	3,495.4	4,140.0	5,285.5		3,495.4	4,140.0	5,285.5

TABLE 13. ESTIMATES OF COMPOSITION OF TOURIST EXPENDITURE IN ANTIGUA, 1959

Length of Stay	Est. No. of Visitors	Average Days' Stay	Tourist Days	Estimated Expenditure												Total Expenditure $000
				Hotel Bills		Direct Wages		Transport		Sport and Entertainment		Purchases		Other Services		
				$ pr. dy.	Total $000	$ pr. dy.	Total $000	$ pr. dy.	Total $000	$ pr. dy.	Total $000	$ pr. dy.	Total $000	$ pr. dy.	Total $000	
a) 6 mths. or more	395	200	79,000	4.00	316.0	2.00	158.0	1.00	79.0	.50	39.5	3.00	237.0	1.00	79.0	908.5
1-6 mths.	808	60	48,480	12.00	581.7	1.50	72.7	1.50	72.7	.50	24.3	2.00	96.9	.50	24.3	872.6
2 wks.-1 month	3,250	20	65,000	15.00	975.0	.50	32.5	2.00	130.0	1.50	97.5	2.00	130.0	.50	32.5	1,397.5
Under 2 weeks	12,152	5	60,760	18.00	1,093.6	.50	30.4	3.00	182.3	1.00	60.8	4.00	243.0	.25	15.2	1,625.3
Cruise ships	5,312	1	5,312	—		.25	1.3	4.00	21.2	.50	2.6	2.00	10.6	.10	.5	36.2
Temporary Halt (b)	33,096	part				.10	3.3	.50	16.5	—	—	.50	16.5	—		36.3
Base (c) Personnel					40.0				56.3		20.0		252.8		40.0	409.1
					3,006.3		298.2		558.0		244.7		986.8		191.5	5,285.5

Notes: (a) Long stay visitors comprise semi-resident visitors who occupy homes rather than hotels. There are also a number of visitors from other W.I. islands in this group.

(b) Temporary halt visitors depart in the same ship or aircraft as they arrived in.

(c) This includes only the expenditure of base personnel in Antigua outside the base. It does not include expenditure on employees' wages and salaries within the base or base residences.

TABLE 14. ESTIMATE OF THE EFFECT OF TOURIST EXPENDITURE ON LOCAL INCOME IN ANTIGUA, 1959

	Hotels	Direct Wages Paid by Visitors	Transport	Sport and Eatertainment	Direct Purchases by Visitors	Other Services	Total
Direct Income							
Wage and salaries, including payments in kind	550.0	298.2	65.0	98.0	55.0	40.0	1,106.2
Profit, interest, rent, etc. (gross)	200.0	—	180.5	25.0	50.8	70.5	526.8
Indirect Income							
Purchases of locally produced goods and services (mainly food) by hotels and tourists	250.0	—	26.0	10.3	111.0	7.6	404.9
Secondary income, i.e. income generated by above incomes	300.0	89.5	271.5	40.0	64.8	33.2	799.0
Total estimated income effects	1,300.0	387.7	543.0	173.3	281.6	151.3	2,836.9
Total gross domestic product, 1959							20,250.1
Proportion: gross domestic product attributable tourist expenditure Total GDP							14%

Note: (a) This table shows estimates of income created by tourist expenditure only. It does not include income created by building hotels and other capital works concerned with the industry.

(b) The "import content" of direct tourist expenditure in 1959 is estimated to be $2,652,000 or 50.1% of total tourist expenditure.

Besides tourist expenditure, some local expenditure is included in the sector Catering, Entertainment and Personal Services. The components of the sector are shown in the following table.

TABLE 15. VALUE AND PRODUCT OF CATERING, ENTERTAINMENT AND DOMESTIC SERVICE

	1957	1958	1959
Expenditure in hotels, restaurants, clubs (visitors and residents)	2,100.5	2,482.3	3,361.3
Domestic servants	725.0	740.0	750.0
Other personal service	390.6	425.0	580.6
Total value	3,216.1	3,647.3	4,691.9
Factor incomes	2,100.0	2,277.7	2,422.2

9. *Professional Service*

This sector includes medical, dental, educational, legal, accounting and religious services. The estimates for religious organizations must be considered as rather broad as little information was available. Doctors, teachers and lawyers paid only by the government are included in government current sector. Where individuals work both for the government and privately, only private earnings will appear under "professions".

TABLE 16. FACTOR INCOMES IN PROFESSIONAL SERVICES

$000

	1957	1958	1959
Medical, dental (private)	138.0	142.2	148.6
Educational (private)	110.5	113.3	115.0
Legal, accounting etc.	96.3	96.7	94.2
Religious	105.2	103.0	105.8
Total factor incomes	450.0	455.2	463.6

10. *Rent of Dwellings*

The recent population census of 1960 showed that there were 13,059 households in Antigua. The average rent per household is estimated at $150 per annum. It is customary to impute a rent for owner-occupied dwellings. Although the figure seems low it must be remembered that it is heavily weighted downward by a number of families which are in fact occupying rooms only.

11. *Government*

In Table 6 the contribution of government includes all factor incomes, that is salaries and wages paid by government and government income from rent and interest, the latter being a very small part of the total.

12. *The Gross Domestic Product at Constant Prices*

All the figures in this report are expressed in terms of actual prices current during the period in question.

It is evident however, that if the price level is increasing in a country the

gross domestic product will show an increase, whilst people may in fact be little better off in real terms than they were before. In Antigua the increases in the gross domestic product, shown in Table 6, are partly due to price increases and partly due to genuine increases in production.

One method by which we can evaluate the importance of the price increases, as compared with the real increases, is by expressing our figures as they would appear had prices remained the same as in a base year. Thus the figures show only the real increase. Table 17 thus shows the gross domestic product at factor cost by industrial origin at constant (1956) prices.

A comparison of the two indices at the foot of this table shows that in constant (1956) prices, the gross domestic product increased from 88 to 113 (1956-100) between 1953 and 1959, whilst at current prices, it increased from 76 to 131. Thus there was an increase of 72 per cent in current prices and 28 per cent in constant prices. This means that if we eliminated the price increase expressed, the gross domestic product in terms of actual output, the rate of growth in the Antigua economy was in average 4.5 per cent per annum. This was satisfactory, but not spectacular; the same figure for Trinidad for instance was 8.2 per cent per annum.

The figures in Table 17 were deflated from those in Table 6 by a variety of methods. In the case of sugar, cotton and other agricultural products, actual quantities in each year were multiplied by 1956 prices. For distribution, the volume of imports and estimated numbers employed were used and for construction estimates were based on volume of capital imports and known changes in prices. Numbers of visitors, numbers of taxis and information about hotel rates were used to deflate transport, catering and entertainment. In the case of government, the problem had to be approached from the price aspect and the product was deflated by known changes in salaries and wages.

IV. National Income, Household Income and Expenditure

The national income is equal to the gross domestic product at factor cost, less depreciation, less payments of income to overseas residents deriving income from Antigua and plus income of Antigua residents derived from investments overseas. Table 18 illustrates how the totals of national income are derived from gross domestic product at factor cost.

Factor incomes paid overseas are mainly the profits of expatriate companies. Any company is classified as expatriate if more than 50 per cent of its shareholding is non resident. The profits shown as going to overseas residents are net of company tax. They however are inclusive of re-invested profit. A great deal of profit of expatriates is re-invested in the island. This is not shown in Table 18 but is included in the capital inflows in the overseas account (Account 7). The item "factor income paid overseas" includes, besides the profits of expatriate companies, banks, etc., dividends paid over-

TABLE 17. GROSS DOMESTIC PRODUCT AT FACTOR COST AT 1956 PRICES

$000

	1953	1954	1955	1956	1958	1957	1959
Sugar	3,367	1,915	2,131	3,089	3,429	2,069	3,429
Cotton	190	190	837	790	363	948	261
Crops	891	919	966	938	938	919	1,041
Livestock	840	841	849	841	882	925	933
Fishing	145	142	156	158	173	191	193
Manufacturing	80	87	89	91	98	109	111
Construction	1,362	1,404	1,404	1,419	1,561	1,632	1,773
Distribution	1,554	1,692	1,709	1,727	1,813	1,848	2,210
Transport	531	549	561	578	624	664	740
Professions	451	460	455	460	465	465	469
Catering and entertainment	1,513	1,513	1,648	1,682	1,867	2,027	2,237
Rent of dwellings	1,205	1,229	1,229	1,242	1,292	1,317	1,366
Government	1,887	1,812	2,490	2,935	2,871	2,958	3,300
Total G.D.P. at constant prices	14,016	12,753	14,524	15,950	16,376	16,072	18,063
Index (1956 = 100)	88	80	91	100	103	101	113
G.D.P. at current prices	12,085	10,702	12,376	15,950	18,085	18,028	20,943
Index (1956 = 100)	76	67	78	100	113	113	131

TABLE 18. THE NATIONAL INCOME

	1956	1957	1958	1959
Remuneration of employees	9,294.6	10,474.1	10,367.9	12,673.7
Profit of farming and enterprise	4,587.8	5,610.3	5,655.0	6,168.9
Non cash income	825.0	750.0	705.0	710.0
Net rent of dwellings	1,242.6	1,250.4	1,300.0	1,390.0
Gross domestic product at factor cost	15,950.0	18,084.8	18,027.9	20,942.6
Less depreciation	— 675.5	— 691.2	— 725.0	— 800.0
Less factor income, income paid overseas	— 658.6	— 775.0	— 223.0	— 831.0
Plus factor income from overseas	542.0	493.0	450.0	450.0
National Income	15,157.9	17,111.6	17,529.9	19,761.6

seas to non-resident shareholders of companies which are themselves classified as resident.

The item "factor income from overseas" includes dividends and interest paid to Antigua residents from investments which they hold overseas. It also includes — and this is by far the biggest item in the figure — wages and salaries earned by Antiguans in the U.S. bases. These bases must be classified as non-resident organizations and any emoluments earned in them can be compared with incomes earned outside Antigua, by residents of Antigua. Long-staying tourists, such as those at Mill Reef, are, however considered as residents for employment purposes and incomes earned in their employ are included both in the gross domestic product and national income. It should be noted that remittances are not classified as "factor incomes" and are not included either in the gross domestic product or the national income. They do, however, enter into the table of household income (Table 19).

It will thus be seen that, whereas the gross domestic product shows the total product (or income) created by economic activity within the Territory, irrespective of whether it is earned by resident or non-resident factors, the national income shows the net factor income (net of depreciation) actually accruing to residents of the Territory. In a country in which there is a great deal of foreign capital i.e. Trinidad, there is a very wide difference between national income and gross domestic product, owing to the outflow of incomes to foreign investors. In Antigua, in the past, the difference has not been great, since the few companies classified as non-residents have not, on average, made very high profits. The outflow of income has also, to some extent, been offset by an inflow of income to employees at the U.S. bases. If foreign investment in Antigua increases, we should expect to see a more marked difference between the national income and gross domestic product. Although it might, at first sight, seem undesirable that a larger proportion of the gross domestic product should leave the country, foreign investment usually increases the total gross domestic product to such an extent that the residents are better off with foreign investment than without — here again the case of Trinidad can be cited.

TABLE 19. THE INCOME OF HOUSEHOLDS $000

	1956	1957	1958	1959
Salaries and wages	9,294.6	10,474.1	10,367.9	12,673.7
Factor incomes from non-residents	542.0	493.0	450.0	450.0
Residents profits (including rents)	4,733.6	5,368.9	6,142.0	6,079.3
Non-cash income	825.0	750.0	705.0	710.0
Transfers from Government (including net loans)	95.0	232.3	211.8	112.1
Transfers from overseas (remittances)	525.0	525.0	550.2	537.6
Household Income	16,015.2	17,843.3	18,426.9	20,562.7

The income of households is shown in Table 19. This is different from the national income in that transfers, which are not factor incomes, are included. These transfers include pensions, relief, and other transfers from government, and loans made to small farmers by government, and remittances and other transfers from overseas. It must be noted that the item "household saving" in Table 21 includes some savings for business purposes as it is impossible to separate "household" from "business" saving in small businesses. This table differs from the receipt side of the Household Sector Account in that loans are shown net.

Table 20 shows the total wage and salary bill for Antigua in each of three years. It will be noted that the total wage and salary bill is well distributed amongst a number of industries.

The profits item in Table 19 includes all non-wage income from farms, business, professions and property ownership which is retained in Antigua. The income from peasant farms is classified as profit, although an estimate is made, and included in Table 19 of wages which peasant farmers may pay to non-members of their families.

TABLE 20. REMUNERATION OF EMPLOYEES BY INDUSTRIAL ORIGIN $000

	1957	1958	1959
Sugar	2,901.0	2,221.0	3,346.4
Cotton	50.0	210.0	40.0
Other crops	121.0	101.0	142.0
Livestock	102.2	99.4	118.0
Fishing	48.8	60.6	58.2
Manufacturing	70.5	75.6	91.3
Construction and engineering	1,047.0	1,006.6	1,452.2
Distribution and finance	1,101.6	1,301.2	1,533.6
Transport and communications	200.4	275.6	301.0
Professions	227.0	235.2	245.3
Catering	1,360.5	1,597.7	1,620.0
Government	3,245.1	3,184.0	3,725.7
Total	10,475.1	10,367.9	12,673.7

The proportion of household expenditure going to food is considered to some extent a measure of the prosperity of the households. With a higher level of income, households tend to increase food purchases, but not to the same extent as they increase non-food purchases. Thus the proportion of

TABLE 21. HOUSEHOLD EXPENDITURE 1956-1959

	1956		1957		1958		1959		
	Total Expenditure of Households	Annual *per Capita* Expenditure	Total Expenditure of Households	Annual *per Capita* Expenditure	Total Expenditure of Households	Annual *per Capita* Expenditure	Total Expenditure of Households	Annual *per Capita* Expenditure	Weekly *per Capita* Expenditure
	$000	$	$000	$	$000	$	$000	$	cents
Meat	700.1	13.1	850.0	15.8	875.0	16.2	930.0	17.2	33
Dairy products	905.6	16.9	950.0	17.7	985.0	18.3	1,061.3	19.7	37
Fish	586.2	10.9	767.3	14.3	868.5	16.1	925.9	17.2	33
Cereals and products	1,420.0	26.5	1,875.0	34.6	1,750.0	32.4	1,950.0	36.1	69
Fruits, vegetables, roots	1,007.2	18.8	1,250.0	23.2	1,296.3	24.0	1,381.6	25.5	49
Sugar and confectionery	475.0	8.9	582.0	10.8	651.6	12.1	715.2	13.2	25
Alcoholic beverages	567.0	10.7	675.0	12.6	690.0	12.8	695.3	12.9	25
Tobacco and cigarettes	131.0	2.4	198.0	3.7	260.0	4.8	313.2	5.8	11
Other foods	364.1	6.8	450.0	8.4	462.0	8.6	586.9	10.9	21
Total Food, Drink and Tobacco	6,156.0	115.0	7,597.3	141.3	7,838.4	145.4	8,559.4	158.5	3.03
Footwear	340.0	6.3	485.0	9.0	540.0	10.0	601.3	11.1	21
Apparel and cloth	1,280.0	23.9	1,456.0	27.1	1,500.0	27.8	1,651.2	30.6	59
Household goods	621.2	11.6	896.7	16.7	962.0	17.8	1,065.8	19.7	38
Personal goods	300.0	5.6	410.6	7.7	580.3	10.8	650.6	12.0	23
Personal or professional service	919.7	17.2	979.1	18.2	1,050.4	19.5	1,112.6	20.8	40
Transport or vehicles	552.6	10.3	750.3	13.9	830.5	15.4	875.6	16.2	31
Rents of dwelling	2,068.7	38.6	2,125.0	39.5	2,207.7	40.9	2,372.6	43.9	86
Purchases from Government (excluding loans repaid)	621.0	11.6	619.7	11.6	649.3	12.8	765.2	14.2	27
Purchases from overseas (including smuggling)	465.0	8.7	725.0	13.9	750.2	13.9	800.2	14.8	28
Direct taxes	216.0	4.0	125.6	2.3	421.5	7.8	403.5	7.5	14
Household Expenditure	13,540.2	252.8	16,170.3	301.2	17,330.3	322.1	18,858.0	349.3	6.70
Household Income	16,015.2	298.8	17,843.3	332.9	18,426.9	342.5	20,562.7	380.9	7.32
Household Saving	2,475.0	46.0	1,673.0	31.7	1,096.6	20.4	1,704.7	31.6	.62

food expenditure to total expenditure declines. There is some evidence of this in that food, including alcohol and tobacco, was 46 per cent of total expenditure in 1957 and 44.5 per cent in 1959. A rise in food prices may well offset this trend however, and in Antigua fresh foods, such as meat, fruit and vegetables, have risen in price. Fortunately the prices of important imported foods such as flour and rice have not materially increased during the period.

The item "purchases from overseas" includes travel overseas by residents of Antigua, direct purchases from overseas – usually steamer or airline tickets – and smuggling.

The item "household saving" is a residual item in the national accounts and cannot therefore be considered entirely reliable. The item includes the savings of households and local businesses inclusive of depreciation. Saving and depreciation of businesses classified as expatriate is not however shown. The value of deposits in the Government Savings Bank changed very little between 1957 and 1959, but the banking habit has increased somewhat and savings deposits in the commercial banks have shown a very marked increase in the Leeward group as a whole.

V. The Sector Accounts

The sector accounts show the pattern of transactions made between sectors of the economy. Every payment made by one sector to another, or to the overseas account, is also found as receipt from one sector to another, in a different account. The sectors included are sugar (which includes all aspects of the sugar industry – cane growing, sugar making and transport), other industries and agriculture sector, savings and investment sector, households sector, government current sector, government commercial sector and overseas sector.

In the sugar account, two transactions are seen relating to cane farmers. The cane farmers are considered as part of the sugar sector. The Peasant Development Office however is in the government commercial sector. Therefore we have to show on the receipts side, the value which the farmers receive from the P.D.O. and on the payments side, the value which the factory (also part of the sugar sector) pays to the P.D.O. for cane. It will be noted that savings and investment made by the sugar industry is not shown in this account. This is because gross profit is channelled through the household account (in the case of residents) and through the overseas account (in the case of non-residents) and then appears in the saving and investment Sector.

The other industries and agriculture account is a sector account for all production and commercial undertakings, with the exception of sugar and government commercial undertakings. The construction and engineering industry is included in this sector account and is inclusive of government

fixed capital formation – the government sector being a current account. The heading "payments for capital works" shown as a receipt from the savings and investment sector is in fact the value of fixed domestic gross capital formation, private and public.

The savings and investment sector shows financial transactions on capital account. It shows sources of capital funds available for fixed capital formation, stock changes and lending overseas.

Unfortunately, it has not yet been possible to obtain the details of overseas lending and overseas borrowing, and only net borrowing and net lending items are included.

The households account shows the details of income and expenditure of households as explained in Section IV.

The government current account excludes capital items, and capital expenditure out of current revenues are shown as being paid to the savings and investment account. The government current sector also excludes electricity, telephones, and the Peasant Development Office which are considered as government commercial undertakings.

The government commercial sector therefore includes these departments. It could be argued that the post office is to some extent a commercial undertaking but the line had to be drawn somewhere, and it is usual to consider post office as part of current government activities. It should be noted that receipts from households also include purchases of produce through the P.D.O.

The overseas account includes all transactions between the various sectors and the rest of the world. It will be noted that the sector account is similar to a balance of payments account only in that payments and receipts are reversed.

These earlier accounts depart from the format of the sector accounts published in the earlier national income study of Antigua only in detail. The main innovation in the new accounts is the introduction of a new sector, "The government commercial sector." This means that certain transactions, formerly cancelled out as intra-sectional transactions, are now shown.

ACCOUNT 1. SUGAR SECTOR ACCOUNT
$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Industries and Agriculture				*Industries and Agriculture*			
Locally sold sugar and rum	494.7	523.8	430.8	For goods and services supplied	1,320.5	876.2	664.4
Savings and Investment				*Savings and Investments*			
Stock change	–55.1	+76.7	+69.5	Special funds	344.5	208.0	343.4
				Households			
Households	—	—	—	Wages	2,901.0	2,221.0	3,346.4
				Profits of locally owned farms	525.6	210.0	530.2
Government current	—	—	—	*Government current*			
				Export duties	185.0	109.5	175.2
				Company taxes	182.0	295.2	150.2
Government commercial				*Government commercial*			
Cane farmers receipts				Electricity and telephone	8.2	9.5	9.8
from P.D.O.	867.1	725.6	750.0	Peasants cane from P.D.O.	886.3	721.2	750.0
Overseas				Marketing commissions etc.	75.0	69.2	101.2
Exports sugar	6,167.5	3,650.2	5,840.9	*Overseas*			
Molasses	111.4	60.1	56.4	Direct imports and profits			
Sugar preference certificates	90.8	114.6	111.8	of expatriate firms	1,248.3	431.2	1,188.6
	7,676.4	5,151.0	7,259.4		7,676.4	5,151.0	7,259.4

ACCOUNT 2. INDUSTRY AND AGRICULTURE ACCOUNT
(Excluding Sugar)
$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Goods and services supplied	1,320.5	876.2	664.4	Locally sold sugar and rum	494.7	523.8	430.8
Savings and Investments				*Savings and Investments*			
Stock change	–387.4	+426.3	+460.0				
Payments for capital works	3,659.0	4,237.5	4,473.2	*Households*			
Households				Salaries and wages	4,328.0	4,962.9	5,601.6
For goods and services supplied	14,700.0	15,509.3	16,889.1	Non cash income	750.0	705.0	710.0
Government current				Profits of residents	4,843.3	5,932.0	5,549.1
For goods and services supplied	486.3	509.6	358.4	*Government current*			
Government commercial				Indirect taxes	1,525.2	1,735.3	2,124.8
Peasants cotton sold to P.D.O.	386.8	1,014.0	370.0	Goods and services purchased and fees paid	322.8	425.8	369.9
Other produce sold to P.D.O.	27.6	24.3	57.0	Taxes on companies	94.9	94.6	143.1
For goods and services supplied	332.0	365.8	364.2	*Government commercial*			
Overseas				Services to farmers and produce (P.D.O.)	285.7	423.7	328.0
Exports goods	288.3	684.9	290.7	Electricity and telephone	160.3	195.7	201.2
Services (incl. tourism)	3,545.4	4,340.0	5,385.5	*Overseas*			
Receipts from non-residents	175.0	292.3	201.7	Imports c.i.f.	11,232.7	12,872.2	13,585.4
				Services and expatriate profits	495.9	409.2	470.3
	24,533.5	28,280.2	29,514.2		24,533.5	28,280.2	29,514.2

ACCOUNT 3. SAVINGS AND INVESTMENT ACCOUNT

$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Special funds	344.5	208.0	343.4	Stock change	–55.1	+76.7	+69.5
Industry and Agriculture				*Industry and Agriculture*			
				Stock change	–387.4	+426.3	+460.0
				Capital works	3,659.0	4,237.5	4,473.2
Households				*Households*			
Saving	1,673.0	1,096.6	1,705.4		—	—	—
Government current				*Government current*			
Stock change	—	219.6	60.0	Cash deficit	—	—	152.0
Cash surplus	9.3	21.0	—				
Capital expenditure	272.0	501.2	909.5				
Government commercial							
Capital expenditure	8.8	6.2	10.0	*Government commercial*			
Overseas				*Overseas*			
Development and Welfare	699.6	599.7	631.7	Net lending	770.9	—	52.6
Direct Investment	980.2	1,250.2	1,547.3				
Other borrowing (net)	—	838.0	—				
	3,987.4	4,740.5	5,207.3		3,987.4	4,740.5	5,207.3

ACCOUNT 4. HOUSEHOLD SECTOR ACCOUNT

$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Wages	2,901.0	2,221.0	3,346.4				
Profits of locally owned farms	525.6	210.0	530.2				
Industries and Agriculture				*Industries and Agriculture*			
Salaries and Wages	4,328.0	4,962.9	5,601.6	For goods and services			
Non cash income	750.0	705.0	710.0	supplied	14,700.0	15,509.3	16,889.1
Profit of residents	4,843.3	5,932.0	5,549.1				
Savings and Investments				*Savings and Investments*	1,673.0	1,096.6	1,705.4
Government current				*Government current*			
Emoluments	2,841.9	2,761.2	3,276.3	Income Tax	125.6	421.5	403.0
Transfers	133.8	110.6	121.3	Fees, fines, purchases	420.0	454.0	474.8
Government commercial				*Government commercial*			
Loans	363.4	395.0	340.8	Loans returned	284.9	294.2	350.0
Wages and Salaries	403.2	422.8	449.4	Payments for services	179.7	194.9	290.2
Overseas				*Overseas*			
Factor incomes from non-residents	493.0	450.0	450.0	Direct purchases (including			
Remittances	525.0	550.2	537.6	smuggling) and travelling			
				by residents	725.0	750.2	800.2
	18,108.2	18,720.7	20,912.7		18,108.2	18,720.7	20,912.7

ACCOUNT 5. GOVERNMENT CURRENT ACCOUNT

$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Export duties	185.0	109.5	175.2	*Other Industries*			
Company Taxes	182.0	295.2	150.2	For goods and services supplied	486.3	509.6	358.4
Industries and Agriculture				*Savings and Investment*			
Indirect Taxes	1,525.2	1,735.3	2,124.8	Capital Expenditure	272.0	501.2	909.5
Goods and services purchased	322.8	425.8	369.9	Cash in hand	9.3	21.0	—
Taxes on Companies	94.9	94.6	143.1	Stocks	—	219.6	60.0
Savings and Investment				*Households*			
Cash deficit	—	—	152.0	Enrolments	2,841.9	2,761.2	3,276.3
				Transfers	133.8	110.6	121.3
Households				*Government commercial*			
Income Tax	125.6	421.5	403.0	Deficits financial	123.8	18.5	—
Fees purchases etc.	420.0	454.0	474.8	Services purchased	42.0	46.6	48.2
Government commercial			61.2				
Overseas				*Overseas*			
Laundry, Harbour and Tonnage dues	73.8	97.3	163.5	Subs etc. in W.I.	74.8	144.0	156.2
Receipts from Fed. area	2.5	4.9	7.1	,, ,, Overseas	78.5	102.6	103.5
Grant in Aid	1,368.2	1,246.4	1,136.0	Direct Imports	125.9	282.1	72.5
Current receipts for overseas	20.4	25.1	15.6	Public debts charges	82.1	92.4	180.3
				Transfers	50.0	100.2	90.2
	4,320.4	4,909.6	5,376.4		4,320.4	4,909.6	5,376.4

ACCOUNT 6. GOVERNMENT COMMERCIAL UNDERTAKING ACCOUNT

$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Electricity and Telephones	8.2	9.5	9.8	Cane farmers receipts from P.D.O.	867.1	725.6	750.0
Peasant cane from P.D.O.	886.3	721.2	750.0	Peasants cotton sold to P.D.O.	386.8	1,014.0	370.0
Marketing commissioner etc.	75.0	69.2	101.2	Other products sold to P.D.O.	27.6	24.3	57.0
				Goods and services supplied	332.0	365.8	364.2
Industries and Agriculture							
Services to farmers and produce	285.7	423.7	328.0				
Electricity and telephones	160.3	195.7	201.2				
Savings and Investment				*Savings and Investment*			
Households				Capital	8.8	6.2	10.0
Loans returned	284.9	294.2	350.0				
Payments for services	179.7	194.9	290.2	*Households*			
				Loans	363.4	395.0	340.8
				Wages and salaries	403.2	422.8	449.4
Government current				*Government current*			
Deficits	123.8	18.5	—	Surplus (electricity and			
Services purchased	42.0	46.6	48.2	telephones)	—	—	61.2
Overseas				*Overseas*			
Exports of cotton	416.1	1,020.5	370.0	Direct import and services	73.1	40.3	46.0
	2,462.0	2,994.0	2,448.6		2,462.0	2,994.0	2,448.6

ACCOUNT 7. OVERSEAS ACCOUNT

$000

	1957	1958	1959		1957	1958	1959
Receipts from:				*Payments to:*			
Sugar				*Sugar*			
Direct imports and expatriate profits	1,248.3	431.2	1,188.6	Exports: sugar	6,167.5	3,650.2	5,840.9
				Exports: molasses	111.4	60.1	56.4
				Sugar preference certificates	90.8	114.6	111.8
Industries and Agriculture				*Industries and Agriculture*			
c.i.f. imports	11,232.7	12,872.2	13,585.4	Exports: goods	288.3	684.9	290.7
Services and expatriate profits	495.9	409.2	470.3	Exports: services and tourism	3,545.4	4,340.0	5,385.5
				Other receipts	175.0	292.3	201.7
Savings and Investment				*Savings and Investments*			
Net lending	770.9	—	52.6	Development and Welfare (capital)	699.6	599.7	631.7
				Direct Investment	980.2	1,250.2	1,547.3
				Other borrowing (net)	—	838.0	—
Households				*Households*			
Travel and direct purchases (including smuggling)	725.0	750.2	800.2	Factor incomes from non-residents	493.0	450.0	450.0
				Remittances	525.0	550.2	537.6
Government current				*Government current*			
Subscriptions etc. in W.I.	74.8	144.0	156.2	Landing, harbour, tonnage dues	73.8	97.3	163.5
Subscriptions exc. to overseas	78.5	102.6	103.5	Current receipts from within W.I.	2.5	4.9	7.1
Direct imports	125.9	282.1	72.5	Current receipts from outside W.I.	20.4	25.1	15.6
Public debt charges	82.1	92.4	180.3	Grant-in-aid	1,368.2	1,246.4	1,136.0
Transfers	50.0	100.2	90.2				
Government commercial				*Government commercial*			
Direct imports: goods and services	73.1	40.3	46.0	Exports: cotton	416.1	1,020.5	370.0
	14,957.2	15,224.4	16,745.8		14,957.2	15,224.4	16,745.8

Labour and Development in the West Indies. Part I

By

G. E. Cumper.

The Worker And His Social Background

The worker, like any human being outside the fables of Crusoe economics, is a member of society and involved in various systems of social relationships with other workers and other human beings. The range of these relationships, in terms of space and of number of persons associated, may be wide or narrow and the intensity of the interaction will differ greatly from one type of relationship to another. In spatial terms, for example, we may think of the Jamaican rural worker as being the centre of a system of social groupings ranging from the household through the neighbourhood and district to those larger units in which the element of face-to-face contact is almost wholly lost and relationships are formalized in political and economic institutions – the island, the federation and the half of the world with which Jamaica is involved in trading relations. In terms of kinship, too, there is an equally wide range from the household in its family aspect through near and distant degrees of kin to the highly abstract but nevertheless emotionally powerful "brotherhood" of coloured peoples throughout the Americas and the world.

In the greater part of his activities the worker deals with other people according to a structural system of roles. Both the worker and the person with whom he enters into a transaction have fairly definite and complex expectations about each other's behaviour. It is characteristic of economic theory to treat of interaction between persons who entertain the minimum of mutual expectations, and the existence of expectations beyond the minimum must modify the operation of the "laws" of economic theory.

If, however, this argument is to have any practical importance we must further show that the part played by what as a convenient shorthand term we can call the "social" factors introduces an important modification into the economic argument and that the operation of these factors is capable of being treated systematically, at least to a limited extent. The latter point is important if we are to advance beyond a formulation in which the operation of economic laws (in the sense of observed regularities of behaviour consistent with economic theory) is conceived of as departed from only in a random fashion, or in non-random but unspecified ways summarised in some such word as 'frictions'.

There can be little argument about the fruitfulness of attempting a

systematic treatment of social factors in the case of certain institutions which are accepted as the proper concern of economists. In the discussion of the theory of wages, for example, it would be ridiculous to attempt to exclude the effects of unions and other combinations of workmen—and this not merely those effects which follow from the minimum characteristics of a union as a collective bargaining agent, but also those which are essentially social in their nature, such as the relation between strike action and the prestige of the leadership or the need to maintain union solidarity. Another field in which the social element has been introduced and treated in some detail, though not perhaps integrated into the main body of economic theory, is the study of consumption patterns, where household type and socio-economic group are accepted as important categories of tabulation and analysis.

It is the aim of the present thesis to explore the extent to which the systematic treatment of the social influences on the West Indian worker can be a fruitful adjunct to economic analysis in a study of productivity and economic development in this area. The present section discusses some aspects of the social background in Jamaica and Barbados and their immediate relation to economic problems, while the final section attempts to relate these findings to the general role of labour in economic development in the West Indies.

The discussion does not attempt to cover all aspects of social life in the West Indies, but concentrates on certain aspects. One is kinship, marriage, family and household; and the data here are organised mainly around the concept of the household, since this is the group with the greatest influence on the functioning of the economy. Another field is that of class and social mobility, and a third that of labour organisation.

The Household

For our purposes the household may be defined as a group of persons sharing a dwelling and making certain consumption expenditures in common —usually through communal cooking and eating arrangements. Most households are based on ties of kinship between the members (though there are certain exceptions); and the process of household formation and dissolution is bound up with the way in which people marry and rear their children. In many societies the household can be treated as identical with the family, though the former is defined mainly in terms of physical relationships and the latter in terms of social interaction. In Jamaica and Barbados family and household are not necessarily the same group; and while no attempt need be made here at an exhaustive description of the relation between the two terms, it will be convenient at some points to broaden the discussion to include family as well as household.

Systematic study of the West Indian household dates only from 1946, when a research team under the direction of Clarke began work on a

study of the family in three selected communities in Jamaica (Clarke, 1957). The Institute of Social and Economic Research of the University College of the West Indies, which began work in 1949, has included in its programme studies of the family in Trinidad (Braithwaite), British Guiana (R. T. Smith), Grenada, Carriacou and Jamaica (M. G. Smith). A number of studies have also been carried out by research workers and research teams from institutions in the United States, among which may be particularly mentioned the Institute of Human Relations of Yale University, the Conservation Foundation and the Program for the Study of Man in the Tropics. All these investigations have been connected; while Clarke's results were not published in full until 1957, what became known of their general trend influenced other workers from an earlier date, while there was association, formal or informal, between most of the later research workers, in particular through the operation of the Institute of Social and Economic Research.

Among the research workers concerned in the projects mentioned above there has naturally been considerable variety of theoretical approach and of methods of analysis. No two projects, for example, have used precisely the same procedure in tabulating and analysing the composition of the households studied. Nevertheless, when allowance is made for the real variation between the West Indian territories it is possible to find a substantial measure of agreement on the general picture of household organization.

In this section the material used is mainly that collected by the writer in the studies in Jamaica and Barbados of which some account has been given above. This material was generally intended to throw light on the marginal area between the sociological and the economic, and so is rather more convenient than that collected for mainly anthropological purposes.

The published material permits one obvious general statement about the household in the West Indies; there is no single mode, either of household composition or of economic functioning, to which the majority of households can be assigned in the same way as the model household in England or the United States can be considered to be that based on the nuclear family of wage-earning man, housewife and dependent children. The West Indian household is often much wider than the nuclear family, in the sense of incorporating distant kin and of its extension through three or four generations; yet there are many households in which no one is present in the role of wage-earning father. These features of the household have been attributed to an independent African tradition of marriage (e.g. by Herskovitz, and more half-heartedly by later writers), but it is doubtful whether many anthropologists would now accept this view. They have been regarded as representing a cultural tradition independent of the upper-class ideal of Christian monogamy, but locally evolved, perhaps directly traceable to the conditions of slavery; and they have been explained as

the result of economic constraints operating on a single culture in which the ideal is universally that of the monogamous nuclear family. These opposing views do not concern us here. It is more important that variations in the form and functioning of the household are not randomly scattered through the economy, but can to some extent be identified with distinct socio-economic groups.

The writer has examined the composition and economic functioning of the household in a number of socio-economic groups in Barbados.[1] This appears to be the only published material which permits something approaching a complete comparison of household forms for a whole West Indian territory. The data show clearly that certain types of household are characteristic of certain groups defined mainly on an economic basis. The demonstration is all the more striking in that Barbados is a small community generally regarded as socially homogeneous.

We can, for example, associate one general type of household with the group (relatively small in Barbados) of peasant proprietors. The typical peasant household lives in a house built on the land owned by the head of the household, who devotes a substantial part of his time to independent cultivation. Besides the head, there is usually present his legal wife, the children of their union and, not uncommonly, a child borne by one of their daughters. Other types of household can be directly related to this general type. The death of the head, for example, may leave a household with a woman as head – but she is head by virtue of her previous position as spouse. The location of headship in the male, the specialisation of the wage-earning function in the male, the universality of legal marriage, the extension of the family through three generations – these are characteristic of the Barbadian peasant household.

Peasant proprietors are found scattered throughout Barbados, but are perhaps commonest in the Scotland district and the part of the windward coast "under the cliff". It would be hard to find a peasant community in Barbados, and most peasant proprietors work for wages on the plantation at some time, many of them regularly, and live in close contact with plantations and plantation workers. In Jamaica, on the other hand, there are villages which can fairly be called peasant communities. One such has been examined by the writer,[2] and it is striking to find that the main features of the Barbadian peasant household are found, often in even more extreme form, in the Jamaican example. In the Barbados sample, 73 per cent of households had a man as head; in the Jamaican community the proportion was 80 per cent. In the former case, 77 per cent of men aged 50-59 were legally married, in the latter case 78 per cent. In Barbados 29 per cent of children under 10 years old were found in their grandparents' household, in Jamaica 21 per cent. It must be borne in mind that the Jamaican

[1] "Household and Occupation in Barbados." *Social and Economic Studies*, forthcoming.
[2] "The Jamaican Family: Village and Estate." *Social and Economic Studies*, Vol. 7, No. 1.

data relate only to a single community and date from 1943, while the Barbadian data relate to a sample of the whole socio-economic group and date from 1955. But a review of other data — Clarke's material on Orange Grove, for example[3] — suggests that we may consistently speak of a certain form of household as associated with peasant cultivation in Jamaica and Barbados.

We have already said that in Barbados peasant proprietors are also usually agricultural labourers, and live among a population of full-time agricultural workers. Yet the household composition of the peasant group is far closer to that of the corresponding group in Jamaica than to that of the Barbadian labourer. There are in Barbados two main groups of plantation workers — those who rent land from the plantation (a specialized relationship involving much besides the mere commercial transaction of rental) and those who have no access to land to cultivate. If we take the latter group as the more extreme case, we find a pattern of household composition in strong contrast with the peasant type. The household still often extends over three generations but it is commonly organised around the woman as head. Men are sometimes present as the heads of households, but it is common to find a man entering a household in a dependent relation through a non-legal union with the head's daughter or the head herself. This group includes many households where the man is a marginal and temporary member.

This Barbadian group cannot be precisely paralleled from published material on Jamaica. This may well be because the Jamaican agricultural labourer with no access to land does not usually remain in his community of origin but becomes a migrant, and so becomes subject to special conditions for which there is no parallel in Barbados. In a paper already cited[4] it has been shown that on Caymanas estate, in Jamaica, a very high proportion of the labourers are migrants, many of them housed in single rooms in the 'barracks' provided by the estate; and in another paper the same was shown to be true of Frome estate. Clarke's data for Sugartown confirm this. In Barbados the barracks is unknown and labour migration is much less. But certain features of the household organisation of Jamaican labourers appear to be comparable with the Barbadian material in spite of these differences — especially the high incidence of non-legal unions and of female household headship. It may be that further work in Jamaica on non-migrant groups of agricultural labourers will show closer parallels to the Barbadian situation.

There appears to be no reliable published material on household composition in Jamaica except for the agricultural groups mentioned above, with the single exception of Davenport's study of two fishing communities.[5]

3Clarke, E. *My Mother who Fathered Me*, London, G. Allen & Unwin, 1957.

4Cumper, G.E. "The Jamaican Family: Village and Estate"

5Davenport, W.H. "A Comparative Study of Two Jamaican Fishing Communities"; Unpublished dissertation, New Haven, 1956.

Even this study is much more informative on the economic base of the communities than on details of household composition. It is clear, however, that in both villages studied there are high proportions of unstable and non-legal unions — so high as to make them comparable with the communities of estate workers studied by the writer. On the other hand, it must be borne in mind that one of Davenport's communities has been built up quite recently by the immigration of fishermen from the Treasure Beach area of St. Elizabeth. The writer has analysed the 1943 census data for this area, and these show clearly that the light-coloured St. Elizabeth populations who provided the migrants have an unusually high proportion of households based on legal marriage and generally appear to lie at the opposite extreme in matters of household organization from the migrant community studied by Davenport. It is suggestive that in the incidence of immigration and in the lack of access to land, this fishing community broadly parallels the conditions of the estate workers discussed above, just as the household composition of the two groups has certain points of similarity of organization or disorganization.

For Barbados it is possible to cite data on various non-agricultural groups. Among what may be called the "white-collar" group, for example — households whose heads follow occupations requiring some degree of literacy, from postmen to civil servants — early and legal marriage is clearly the dominant mode and the typical household is the nuclear family, with servants and sometimes a mother or aunt of the head or his wife.

Among the very large group of skilled workers' households, legal marriage again predominates over other types of union and again the age at marriage is relatively early. But it is not true, as it was of the white-collar households, that marriage invariably leads to the setting up of a new household, since it is not uncommon for a man on marrying to live with his wife's parents.

There is, finally, a very large group of households in which the head is a domestic servant. These are, by definition, mainly households with a woman as head; they include few men, and those men who are present are held by the bond between mother and son and not by that of marriage, legal or other. Yet many of these households receive money from the absent husband or "boyfriend" of the head. It is in this group that one finds a high proportion of unstable households — temporary partnerships and unions, mother-child groups broken up when the mother gets a job which involves "living in", and so on.

It seems reasonable to suggest that the non-agricultural population of Jamaica will show features of household composition and organisation broadly similar to that of Barbados. The features which in the account given above characterise the white-collar household, the skilled worker household and the domestic servant household are at least familiar as types to anyone acquainted with the Jamaican scene. It may be that such differ-

ences as exist between Jamaica and Barbados are traceable to the operation of identifiable economic or social factors, such as the importance of external migration from Barbados and of local migration within Jamaica. We can, however, assume a similar range of household forms in both islands.

The variety of types of household sketched above is of importance to the present thesis because it implies a variety of ways in which the household takes part in the economic processes of production and consumption. Let us take first the productive aspect. The household may or may not be a productive unit in the conventional sense (e.g. a family business) but its members must, if they are to preserve their equilibrium with the rest of the society, produce some marketable utilities and will, by the nature of the institution, also produce utilities of a type which may not be marketed (e.g. child care, sexual gratification, domestic service). The varying ways in which these aspects of production can be combined can be illustrated from the types of household we have discussed above.

In the peasant household we have an example of a household which is itself a productive enterprise in the ordinary economic sense. Roles within the enterprise are established by custom in a way whose economic rationale is clear – certain work (e.g. the management of production, the heavy field labour) is properly that of the head, other aspects are appropriate to the head's wife, (the marketing of produce except in large units), to the children according to age and to any grandchildren who may be present and of working age (e.g. tending small stock). Contractual relations may exist between members of the household (e.g. where the wife owns land in her own right, the husband may cultivate it on agreed terms; and the father may pay a small wage to an adult son) but the range of such relations is limited. So, too, the welfare of the household enterprise imposes limits on the extent to which its members perform productive labour for outside employers. The head of the household will perform seasonal, casual or jobbing work but not a regular job which would take precedence over his cultivation at the crucial times such as planting. The head's wife will market the household produce but this is her only approach to the labour market. It is only the young men and to a less extent the young women who are free to take wage work of a regular kind, and even these do so, unless they migrate and separate themselves from the *mores* of their parents, with the aim of setting up their own household in due course.

The household of the skilled worker is not normally an enterprise. The household's equilibrium with the rest of the economy is maintained principally through the earnings of the household head in his wage relation with his employer. Whereas in the peasant household the production of marketable utilities was distributed among those family members (including the wife) who took part in cultivation, and the production of non-market utilities such as child-rearing was also dispersed because of the

presence of older children and other kin, in the skilled worker household market services are provided by the head and other services by the wife.

The household of the white-collar worker presents yet another variation. Here, as in the skilled worker household, it is part of the head's role to earn the bulk of the household income. But it is also permissible for the wife to resign her role of child care and domestic service to paid servants when the household income permits, and either devote herself to the remainder of her role as provider of non-market services (e.g. by actively asserting the household's social status) or herself earn income from a job in the white-collar grade. In this group the productive role of the children is very small.

All these variations exist in groups where legal marriage and some degree of family stability are the rule. At the other extreme, among the agricultural labourers and domestic servants, it is hard to make any assignment of household roles which is not subject to innumerable exceptions. It is still true, for these groups as a whole, that the household tends to receive most of its external income through a man and that most of the non-market services are provided by women. But the roles are not vested uniquely in specific members of the household. The male earner may be son, absent husband, temporary boy-friend or may not be traceable at all; the housewife may be the head's daughter, other relative or a person hired to provide a specific service (as when a young labourer pays a girl to launder or cook for him). The onus of earning income may shift from member to member of the household, or outside the household altogether (as when kin are called on to contribute to support a member who is unemployed or sick). The diffusion of the earning role over both men and women in the household is one of the striking features of the low-income groups in the West Indies. On the other hand, there is no corresponding diffusion of the role of child-rearing, household care and so on; men may at a pinch do their own laundry and look after their own room, but it is rare for them to stay home and mind the children, or carry out domestic services for other members of the household, even when unemployed.

One application of this type of analysis is to the interpretation of such statistical data as are available on the Jamaican and Barbadian labour force. A just evaluation of the statistical material is necessary for the realistic discussion of local problems. As an example we may take the very high expenditure of labour in Jamaica on the marketing of locally produced foodstuffs. On the local level, this leads to the argument that resources are being wasted in non-productive effort, backed up by the suggestion that the weekly absence of farm wives to carry small produce to market must lead to neglect of their families. Both these points are seen in better perspective if it is realised that many of the women engaged in marketing are members of households of what we have called the peasant type, in which the role of "higgler" is normally assigned to the wife, who would otherwise

not enter the labour market at all, and in which there are usually other household members who share the tasks of child care and domestic work. An exhaustive discussion of the problems presented by the Jamaican internal marketing pattern would of course have to take into account many other aspects of the system, both as a social institution[6] and as a form of economic organisation. But any useful discussion must rest on some knowledge of the social content of the statistical categories used.

This is equally true of international comparisons of labour force data. If for example an attempt is made to evaluate the stage of development reached by the West Indian economies through a comparison of the proportion of their labour force engaged in primary, secondary and tertiary occupations, the high proportion in tertiary occupations (actually in domestic service and petty trade) may lead to the misleading conclusion that the West Indies are in some sense mature economies. The high proportion of women in the labour force has also been interpreted in this way. In fact overall labour force data can only be used in this way if the social and economic contexts compared are similar.[7]

When we turn to the relation between the form of the household and its expenditure pattern, we enter a field in which it is possible to make certain general statements but difficult to find a firm base for these in empirical data. There are two reasons for this. The first is the lack of data on expenditure patterns in the West Indies.[8] For Jamaica there is available a tentative analysis of the household survey carried out in Kingston in 1954. For Barbados we have the results of a survey carried out by Straw in 1951-52. The results of an expenditure survey in British Guiana have also been published (Paro, 1956). In all these cases the main object of the Government promoting the survey was to provide a satisfactory basis for the cost-of-living index, and other uses of the data received much less attention. Generally, more detailed analysis of expenditure patterns requires a larger sample size than is justifiable if the aim is to obtain an average distribution of expenditure over all classes of households, and requires also a more complete coverage of the higher income groups; in the Guianese survey, for example, the not uncommon practice was followed of omitting all households above a certain point on the occupational scale from the sample. Hence, in analysing the Jamaican and Barbadian data, we constantly find situations in which the number of cases in a crucial sub-class is too small to permit more than a tentative conclusion.

The second difficulty in finding empirical evidence on the expenditure

[6]See Mintz, S.W. "The Jamaican Internal Marketing Pattern." *Social and Economic Studies*, Vol. 4, No. 2., "The Role of the Middleman in the Internal Distribution System of a Caribbean Peasant Economy," *Human Organisation*, Vol. 15, No. 2.

[7]See e.g. Bauer, P.T. and Yamey, B.S. "Economic Progress and Occupational Distribution," *Economic Journal*, Dec. 1951.

[8]Cumper. G. E. "Expenditure Patterns, Kingston, 1954." *Social and Economic Studies*, Vol. 7, No. 2. "West Indian Household Budgets" *Social and Economic Studies*, Vol. 9, No. 2.

patterns of different types of household is the virtual impossibility of isolating household type as an independent variable. To decide on a set of types is itself much more difficult in the West Indies than in countries where the range of variations is more limited and where the cultural norms of family life are more precise and more uniformly applicable. Even if this difficulty can be overcome, household type is strongly correlated with other variables — occupation, income, class — which are of independent importance in the analysis. If we attempt by statistical means to isolate the effect of household type, we find ourselves faced both by the limitation imposed by the size of the original sample and by the conceptual problem of how far such isolation is justified.

It seems best, therefore, to accept the limitations on empirical analysis in this field and to begin by a broad picture of those features of the expenditure patterns of Jamaican and Barbadian households for which the evidence is satisfactory, attempting later to suggest points at which the form of the household itself may be of particular importance. In so doing we shall to some extent anticipate the discussion of a question which is taken up below — the influence of class on consumption patterns.

There can be no doubt that the factor which accounts statistically for the greatest portion of the traceable variability in the expenditure patterns of households both in Jamaica and in Barbados is the level of household income. The variation by income level can conveniently be considered in two stages; the balance between income and expenditure, and the distribution of expenditure between the various objects of consumption.

It is, of course, common in expenditure surveys, even the most sophisticated, to find substantial discrepances between income and expenditure. These discrepancies may arise either from genuine saving (or dissaving) or from defects in the data. In the Jamaican and Barbadian material we find that average weekly incomes exceed current expenditures in the higher income groups, while the converse is true in the lowest income groups. Both sets of data have been subjected to careful editing in order to get rid of discrepancies arising from enumerators' errors, and in addition the rule has been followed of treating the sum of current expenditure *plus* recorded savings as the best estimate of a household's income in any case where doubt was thrown on the accuracy of the income reported. The discrepancy remaining between income and current expenditure therefore represents an estimate of the savings of the household. In the Jamaican case this estimate refers to a single week. In the Barbadian data the estimate is the mean of separate estimates for the household in question for two survey weeks, one in the crop season and the other in the "hard times". In either case, the savings referred to are of a very short-term character, being mainly the incurring and paying-off of shop debts, or the building up or drawing down of balances kept either in cash in the house or in agencies like the Government Savings Bank and the Friendly Societies. It is only in the

higher income groups that a substantial amount of long-term institutionalized saving occurs, and even here much of the savings accumulated in a week are probably spent within the year – on payment of taxes or on the purchase of durable goods.

The heavy dissavings recorded for the lowest income group in both the Jamaican and the Barbadian surveys may be partly spurious – exaggeration of the excess of expenditure over income arising either from over-reporting of the former or under-reporting of the latter. It is certain that incomes from socially disapproved activities – theft, begging, prostitution – are not reported, or are falsely reported. But it is unlikely that this is the only explanation of a situation which involves more than half the households in either sample. More important is the effect of sharp variations in income from week to week. In a sample of households where weekly income is variable but to some extent predictable over the longer period, it is inevitable that those households whose current income is below their expected average level will tend to show dissavings, since they will not vary their consumption in proportion to changes in the current week's income. Shop credit has been built up in the West Indies into a social mechanism which meets just this problem.

Among households with variable income, we can distinguish two main types. In one, the variation arises from the unstable earnings of a permanent member of the household, for example, a dock worker who may earn large sums at irregular intervals. In the other type, the variation arises from a change in the composition of the household – for example, the young woman who receives support from time to time from different "man friends". In this case, it would be justifiable to regard the woman, with any children she may have, as in some sense an incomplete household. Intermediate between the two types is the domestic servant who alternates between periods of unemployment, when she appears as a distinct unit of consumption with a very low income, and periods of employment, when she is partially absorbed in the consumption pattern of a high-income household. The former type is probably less common in the Jamaican urban sample than in the Barbadian sample, since the average size of the households in the lowest income group in Jamaica is rather less than in Barbados (1.7 adults and 0.8 children, against 2.0 adults and 1.0 children).

If we are right in assuming that the amount of recorded savings in the lower income groups reflects mainly the balance between actual earnings and the desired standard and pattern of consumption, the point on the income scale at which dissavings are zero should afford some indication of the standard of living in different places and for different groups. In Kingston in 1954, for example, the point of zero saving was at about £4 per week; in the urban sample from Barbados in 1951-52 it was between $30 and $35 a week (£6 to £7), and in the rural sample between $15 and $20 a week. Some difference in the point of zero saving between Jamaica and

Barbados was to be expected, since the average Barbadian household is larger at a given income level than the average Kingston family. At the zero points given above, the Barbadian household is one and a half times the size of the Kingston household. The level of living *per capita* at these points is therefore much the same for Kingston and for urban Barbados, but substantially lower for rural Barbados. There is, of course, a considerable occupational difference compounded with the urban-rural division here.

The same approach can be applied to find the standard of living associated with different occupational groups. If, for example, we separate the households in the Barbadian sample into three groups, according to the occupation of the head of the household – white-collar households at one extreme, labourers' and domestics' households at the other and an intermediate group consisting mainly of skilled workers' households – we find that the point of zero savings for the white-collar group is at an income level of about $35 per week, for the skilled group at about $24 per week and for the labourers at about $13 per week. The average household size is much the same for the three groups, so that we can take these figures as an estimate of the cost of maintaining the standard of living appropriate to the average family in each group in Barbados in 1951-52.

Following out this approach, it may be suggested that the nature of the relationship between expenditure and income is of interest from another point of view. We should expect the extent to which the expenditure curve rises above the income curve at low levels of income and falls below it at high levels to reflect, among other things, the flexibility of the standard of living of the group concerned. A group whose standard of living is strictly determined by cultural conditions, for example, is likely to show greater divergencies between income and expenditure at a given income level than one which is able to adjust its consumption according to its current income.

Examining the Jamaican and Barbadian data from this point of view, we find that the Jamaican urban data suggest the greatest degree of flexibility, and the Barbadian rural data the least. While the limitations of the data make it impossible to be confident that this is so, it is at least a reasonable interpretation; Kingston enjoys to a greater extent than Bridgetown one of the important attributes of a city, that the degree of cultural conformity in standards of living is less than in rural communities, and the range of goods and services available for the higher income groups is greater.

On the same argument, we find, as already stated, that in Barbados the expenditure of the white-collar group is more flexible in response to differences of income than that of the skilled and labourer groups. This, again, is not unreasonable; the white-collar household is unlikely to run heavily into debt at low levels of income except under extreme pressure of circumstances, since the avoidance of debt is one of the values of the group, while

at higher income levels it is likely to find more varied objects of consumption on which to spend its money.

The way in which expenditure is distributed between different broad classes appears very similar in Kingston and in Bridgetown. The accuracy of any comparison is limited by the size of the sample and by the strong correlation between income level and the proportion of expenditure going to certain items. But if we take for comparison the levels of income corresponding to zero saving we find that the proportionate importance of the main class of expenditures, those on food and drink, is almost identical in the two cities, as is the expenditure on housekeeping. These two account for about 56 per cent of all expenditures. Personal and miscellaneous expenditures, the next largest class (about 22 per cent) are also of the same importance in both cases. Housing, on the other hand, appears to account for a much larger proportion of current expenditure in Kingston. This corresponds to the much larger proportion of rented houses there than in Bridgetown, where many urban workers live in their own houses, though on rented land. Expenditure on durable goods (clothing and furniture) appears more important in Bridgetown, though it must be mentioned that this is the point at which errors of enumeration are most likely to have occurred. The organisers of the Kingston household survey on which our data are based have suggested that clothing expenditure may have been under-reported by as much as 20 per cent. The remaining class of expenditure, on transport, shows much the same importance in both cities.

A comparison of the urban and rural data for Barbados suggests a higher expenditure on food and a lower expenditure on housing and personal and miscellaneous expenditures in the rural area. It may seem paradoxical that more expenditure on food should be required in the country than in the town; but the proportion of the food supply of Barbados grown locally is very small, and most staple foods, with the exception of sweet potatoes, are imported through Bridgetown. The relatively low expenditure on personal and miscellaneous items is to be expected; it is in this field that spending opportunities are less in the country – less cinemas, less cheap cosmetics and so on.

A similar comparison can be made of the three main occupational groups at the income level corresponding to zero savings. The white-collar households show a relatively heavy expenditure on housing and on personal and miscellaneous expenditures. The skilled group spends relatively heavily on clothing and furniture, and the labourers' group on food. These results tend to confirm the results of the urban-rural comparison, since the white-collar and skilled groups tend to be more urban in distribution than the labourers' group.

How far is the household to be considered an important factor in producing these variations in expenditure patterns? On our data it is not possible to give a definite answer, but it is possible to find some suggestive

correspondences between the nature of the household as it is known in different milieux, and our evidence on the pattern of living in the same milieux.

The evidence we have given above and set out at more length elsewhere on variations in the nature of the household in Jamaica and Barbados can be summarised by saying that it varies in two main ways — in the degree of cohesion of the household group and in the length of time (extending even to more than one generation) for which the group is likely to retain some solidarity. We can expect these variations to be manifested in the distribution of household expenditure between objects which are individual and others which are collective in their use, and between objects of immediate enjoyment and those which imply an extended time-horizon.

Among the labourer group the household tends on the whole to be less cohesive and less stable than in the other groups. In this group we find a concentration of household expenditure on food and drink, an item which is neither collective nor "prospective" in nature. Moreover, among items which have some element of savings, we find that those which are essentially short-term (shop credit and its paying off, cash hoarding) preponderate over longer-term types of saving such as insurance and pension schemes.

The skilled household tends to be more cohesive and to have a moderately long time horizon. In this group we find a concentration of expenditure on consumer durables which are for collective use (furniture, children's clothing). We do not, however, find very much emphasis on expenditures whose fruitfulness depends on the continuance of the family beyond the life of its head, or expenditures designed to maintain the economic status of the family from generation to generation, such as housing and education.

The white-collar household is highly cohesive and it is one of the aims of the typical family to see their children qualify for the same or a higher economic level. Hence long term expenditures are prominent — housing, education, life insurance, pension schemes. Another item which assumes particular importance in the white-collar households is the farming out of domestic services, by giving out laundry and by employing servants to do the housework. This is perhaps the point at which family organisation manifests itself most directly in the pattern of expenditure.

It is therefore possible to trace a certain congruence between the type of household found in a given context and the typical expenditure pattern. There is also, no doubt, a possibility of tracing the influence of the household as such, independent of its association with other social factors; household size as such would probably not be a useful variable, but a meaningful set of household types, or of stages in the life of households, might very well prove fruitful. Unfortunately the statistical operations needed to isolate any such influence cannot be carried out on so small a sample as ours. Nevertheless, even by regarding the family as only one among many interacting social factors one can shed at least some light on the variations in

household patterns of expenditure, and increase one's understanding of the, in themselves not very meaningful, data on expenditure by income groups.

This increased understanding is particularly useful if expenditure data are to be given a wider sphere of usefulness than that to which they have been traditionally assigned in the West Indies – serving as a basis for the cost-of-living index. Even this index, of course, owes part of its unreality to its attempt to average the expenditure patterns of different groups with different needs, arising from differently functioning household systems among other things. If, for example, an attempt is to be made to use the income group elasticities deduced from changes in expenditure patterns from one income group to another in order to predict the probable changes in consumption which will accrue from general increases in income, as has been suggested in a published paper (Cumper, 1958), then it becomes of considerable importance to assess how far income increases can be considered in isolation and how far they need to be linked with other variables, among them that of household type. To take a hypothetical case but one of a type which may well arise, let us assume that we wish to assess the effects on expenditure of a given rise in incomes in a community where there are many households with very low incomes. We may take the simple view that an increase in income will merely raise their average value without altering the form of the distribution, so that for a given increase the number of low income families will fall rather slowly. But it may be necessary to consider that in the West Indies the households in the lowest income groups are often *disjecta membra*, made up of women living independently because, among other reasons, the economic pressure of poverty on single male earners hinders the establishment of the nuclear family. The effect of an increase in average incomes may then manifest itself through an increased rate of formation of middle-income households, as men find that their increased incomes justify them in taking on a permanent family responsibility. The low-income households headed by women will then disappear more rapidly than would be expected at first sight, while the expenditure of the whole group will then be given a bias toward what we have called "collective" and "prospective" uses.

To summarise: we have presented data and arguments to show that a consideration of the nature of the West Indian household and family can be helpful to economic analysis through the greater understanding it affords in interpreting descriptive and statistical material on the labour force and on patterns of expenditure, and through the greater precision it promises to offer in analysing and predicting the role of labour in West Indian eonomic development.

Class and Occupation

Any discussion of the role of the concept of social class in economic analysis must face considerable definitional difficulties. The household and the

trade union can be defined with reasonable precision in terms of their membership and their functions. Class, on the other hand, is an imprecise concept in a fundamental way. The emotional load it is often made to carry, and the conflict of usage between different writers, are incidental difficulties. Beneath these lies the problem of incorporating consistently in one definition the various factors which people feel ought to be comprehended in the division into classes – the intuitive approach (what one feels one's own class ranking and that of others to be), the definition by membership in group action (by which the intellectual who marches on May Day becomes an honorary member of the working class) and the definition by common attributes (economic, such as income and occupation; social, such as the use of non-U speech forms). All these criteria may be used as approximations to the single discontinuous status ranking which seems to be the ideal lying behind most discussions of class; but none of them can be used alone ignoring important information provided by the other approaches, nor on the other hand can they be used together without introducing inconsistencies into the ranking on various bases. One might, in theory, cut the Gordian knot by a kind of Gallup poll – by asking every member of a community to rate every other member as to class and combining the resulting ratings. This would not, however, get rid of a more basic inconsistency – that a given person does not occupy a single status ranking, but one which varies according to his role in a given situation. The parson, for example, takes precedence of the Jamaican M.H.R. in the church hall, but not at the political meeting outside.

In this section we avoid these problems by speaking mainly in terms of broad occupational groups. These groups can be ranked only very roughly in terms of status – white-collar workers can be regarded generally as higher in the scale than skilled workers, and skilled workers as higher than labourers, but there are comparisons (such as that between labourers and domestic servants) in which no attempt can be made here to assign the higher status.

Some important aspects of the economic role of class groupings have already been covered in the discussion, above, of the role of different types of family in the system of production and consumption. We have suggested that there are considerable differences in the way in which the productive roles are distributed between family members in different sections of Jamaican and Barbadian society, and considerable variations also in consumption patterns from section to section. There remain certain features of the class division of West Indian society which have important economic effects and which are less closely connected with the household or family than the foregoing. Those we shall deal with here are the problems of communication; of the interaction of economic and status relations in business organisation; of occupational mobility, and of the diffusion of new consumption patterns. It is hardly possible to quote specific sources for what

is said on these problems, since except for occupational mobility none of the subjects have been intensively studied in the West Indies.

In any society with well-marked class divisions, differences of linguistic usage are likely to exist; and in any economy where the organization of business is complex, communication between members of different groups is necessary to the industrial process. In Barbados and Jamaica class differences of speech are on the whole less marked than in certain neighbouring territories – they do not amount to the total separation of two language groups as in parts of Latin America, nor even to the existence of as distinct a patois as in Haiti. In Barbados, in particular, the difference between the language of the planter and that of his labourers is often slight; a high generally literacy brings the language of the workers nearer to standard English, while a high degree of local patriotism makes it the reverse of shameful for the planter to adopt the Barbadian accent and idiom. In Jamaica, leaving aside the problems of the immigrant groups like the Chinese and the Indians who have in varying degrees abandoned their distinctive languages, there are considerable differences of accent, vocabulary, idiom and syntax between, say, the white-collar group and the labourers. Each group, and even most individuals in each group, will command a range of degrees of dialect, but there exists sufficient difference to pose problems of communication within large enterprises.

The problem is made much more difficult by the fact that these dialectal differences possess status value. Thus while an employer may well be able to phrase an instruction in the way which will make it intelligible to his workers, he may refrain from doing so since to do this habitually would jeopardize his distinct status. Hence in industrial organisations which include a wide range of status – for example, on a sugar estate – there exists a hierarchy of subordinate management whose function is in part that of filling gaps in the chain of communication. The difficulty is thus overcome in the case of commands passing down the chain, but often remains in the case of information and complaints passing up from worker to employer.

A similar, but wider problem arises from the fact that economic relationships of the employer-worker type tend in the West Indies to carry with them a greater status content than in industrialised countries. The attitude of an employer vis-a-vis his workers is determined not solely by the balance of advantage involved in the exchange of wages for labour, but by the non-economic tributes paid by the labourer to the employer. Traditionally, it has been as important for the worker to manifest respect as for him to work efficiently. Thus, for example, a strike may meet resistance from the employer not because wage concessions would cause him serious economic loss but because it involves a lack of respect for the workers to seek to obtain as a right or a bargain what they should, by the traditional way of thinking, have sought by deference. A rather similar situation may arise where a small farmer who has established a relation of deference with a

produce dealer seeks, on purely economic grounds to carry his produce elsewhere. Conversely, there is a traditional obligation on the employer not to lay off a worker for economic causes as readily as he can do so for lack of respect. The way in which such influences can hamper economic change is shown in Davenport's account of the introduction of a producers' co-operative into a Jamaican fishing village.

Since occupational groups are generally agreed to be part of the basis on which the classes of a society are formed, occupations tend to take on a social significance beyond their purely economic implications, and changes of occupation may involve a worker in the difficult social process of stepping across class boundaries. But changes in the occupational pattern of the labour force are a necessary part of economic development. Hence so far as the existence of classes impedes such changes it is of economic importance.

The writer's study of occupational mobility in Barbados mentioned above has shown that in that island certain accepted channels of mobility can be distinguished. There are three main occupational levels — the white-collar, the skilled and the labourer. Between the extreme groups mobility is very slight. Beween the labourers and the skilled group, or between the skilled and the white-collar, it is rare for an individual to move during his working life. But a family may move between them, in the sense that the child of a labourer becomes a skilled worker through the established system of apprenticeship, and the child of a skilled worker becomes a white-collar worker through the system of secondary education. Such mobility as takes place during a person's working life is rather within one of the groups. Thus the labourer may raise his status from that of a man without land to that of an independent cultivator who works for wages for only part of the year, and the skilled wage-earner may move over to be a self-employed artisan or small contractor; and by doing so he increases the probability that his children will move up into the next occupational level. The weakest link in the chain of mobility is within the white-collar group; it is not difficult to enter the lowest levels of this group, which include clerks, postmen and salesgirls in small shops, but it is difficult to move from this level to a higher degree of control of one's own economic destiny, as the skilled worker can do by setting up on his own account and the labourer by acquiring land. A system of scholarships permits a small number of children from the lower levels of the white-collar group to go to university and enter an independent profession, but very few from these levels will be able to acquire their own business enterprise. At this point the social pressures become important; if the economic obstacles in the way of a lower middle-class Barbadian who aims at running his enterprise can be overcome, the man is likely to find himself in a social limbo, since his origin will prevent his assimilation to the existing business group. Outsiders tend to attribute this to colour prejudice; in fact colour is only one aspect of the elaborate

system of social identification and "status ascription" which is possible in a small and relatively stable community.

In Jamaica we find a rather different situation. The means for mobility between the labourer and skilled groups and between the skilled and white-collar groups (apprenticeship and education) have for many years been less effective in Jamaica than in Barbados. The chances of movement within the labourer group and within the white-collar group, on the other hand have been much greater. Over the last century the cultivated area of Jamaica has expanded steadily, the expansion slowing down only in the last twenty years or so, and the opportunities for independence through the acquisition of land have been much greater than in Barbados. Then, too, it is many years since there existed in Jamaica an entrepreneurial group as socially united as that in Barbados — the old white plantocracy was long ago displaced from domination by the rising brown group and by the old Jewish minority, while the success of later immigrant groups like Chinese, Syrians and Indians has further increased the social heterogeneity of the groups which compete for economic control. Hence in Jamaica there exists an important channel of mobility by which the children of a cultivator can aim for the professions and even for large-scale business enterprise in the third generation.

Hence there can be found reasons other than the economic ones why Barbados over the last half-century should have followed a pattern of thorough exploitation of a limited range of economic opportunities, based on its good supply of skilled and literate workers; while the history of Jamaica has been that of exploitation, with perhaps a technically inferior labour supply, of a wider range of possibilities.

Another point at which considerations of status tend to attach themselves to, and to modify, economic transactions is in the consumer's choice of objects on which to spend his money. Consumption patterns are the resultant of a number of forces — of the availability of goods of different kinds, of their prices and of consumers' incomes; of the knowledge a given group has of the range of goods available to it, and of culturally determined preferences. Traditionally there have been in Jamaica and Barbados considerable differences in consumption patterns from class to class beyond what can be explained on economic grounds or in terms of the differences in household circumstances dealt with above. Among food expenditures, for example, there appears to have been a preference among the white-collar group for foods which are associated with high status ("Irish" potatoes, for example, rather than locally grown starchy foods such as yam and sweet potato) and a preference among the working class for bulk foods (such as yam and rice) even when a more diversified diet is available.

To attempt to trace all such preferences to their social origins would be an impossible task. It is more important to draw attention to the ways in which class differences of tastes are being diminished by various pressures,

social and economic. The process has gone further in Jamaica and the nature of these pressures can be more easily distinguished. Migration has played an important part; since the turn of the century tens of thousands of Jamaicans have spent long or short periods in countries with relatively small class differences in consumption patterns – the United States, and since 1940 the United Kingdom – and in this way have acquired, and passed on to their relatives in Jamaica, a wider knowledge of the range of goods available, and have lost their prejudices against new kinds of consumption. Internal migration between the countryside and Kingston has played a similar role on a smaller scale. Then the traditional importance of domestic service has also acted as a channel by which middle-class tastes can be passed on to working-class families, particularly patterns of diet and child care, the aspects of consumption with which servants are most concerned in their work. The availability of cheap varieties of middle-class goods has worked in the same direction; it is said that the importation of cheap Japanese shoes in the 1930's completely changed the general attitude to barefootedness – and incidentally greatly reduced the incidence of hookworm. Finally, in the last few years a marked expansion of industrial activity has brought a number of economic changes. Since it is now more worthwhile to cater to the needs of the working class consumer, the sharp distinction between middle-class stores and small shops is becoming blurred, particularly in Kingston; while traditional items of food are losing their advantage of cheapness in competition with imported or more highly processed substitutes – yam, for example, is now much more expensive than formerly in relation to cereals, and bottled soft drinks compete with the traditional vendors of "snowball" and "mauby" even for poorer customers. There are, then, a number of forces working at the moment to blur the distinctions between the consumption patterns of different groups in Jamaica, and to a lesser extent in Barbados.

Labour Organisation

In turning now to discuss the economic role of labour unions in Jamaica and Barbados we come to an institution which is much more limited in scope than family or class. The family is a universal institution and one which affects all aspects of the life of its members. Class, however we define it, is at least a very widespread phenomenon and is found in all industrially developed societies. The labour union, on the other hand, is by formal definition to be found only in societies where a particular type of economic relationship exists, and, again in formal terms functions only to influence that relationship.

If the West Indian trade union could be realistically defined in these formal terms there would be little to say about it that could not equally be said of unions anywhere. But in fact any attempt to treat West Indian Unions on this basis leads to absurdity. In the historical account we have

shown how the present labour unions grew out of very far-reaching changes in the social and economic situation of the Jamaican and Barbadian worker. These changes have influenced the form the unions have taken, the functions they have performed, and the operation of the unions as economic institutions.

While no comprehensive account of West Indian unions exists, there are a number of works which must be cited as sources. A useful summary of the formal structure of the unions and of their degree of success as purely industrial organisations is given in an unpublished paper by W. F. Evans. A general account, perceptive though superficial and even inaccurate in parts, is given by Knowles.[9] Rottenberg has published an account of unionism in Grenada which attempts to deal directly with the question of the non-economic functions of the union, and much of what he writes is equally applicable to Jamaican unionism in its early stages.[10] A very useful summary of the history of Jamaican unions to 1946 compiled by Morais for the Jamaica Bureau of Statistics was published in 1948, and its interest is not diminished by the fact that its circulation was restricted on political grounds. But the atmosphere of the early years of West Indian unionism — chaotic, individualistic and flamboyant — can only be gathered by talking to those who were concerned with labour relations at that time. I have been fortunate in having good opportunities for this type of personal contact in Jamaica, and in Barbados worked for a year in close contact with the Labour Department at a time of some industrial unrest. What is written below is founded at least as much on personal impressions of this kind as on written sources.

In an historical account it would no doubt be appropriate to take the time of origin of the labour market in the West Indies as 1838, the end of slavery and the beginning of "free" wage relations. But for the great majority of Jamaican and Barbadian workers the wage relationship remained relatively undifferentiated until the 1930's. If we take the three broad groups which are useful for so many purposes of labour analysis, and consider the peasant, the estate labourer and the urban worker, we find that only in a minority of the latter group was the relationship between employer and worker at all close to the economic model of a transaction between independent agents.

Among the independent cultivators, for example, who formed so important a part of the Jamaican rural population from the 1870's onward, it is evident that work within the family enterprise was conducted on a mainly non-wage basis. Wage arrangements existed between the families of cultivators in the same community, but they were closely circumscribed by the system of social restraints which Smith has described as existing even

[9]Knowles, W. H. *Trade Union Development and Industrial Relations in the West Indies*, Berkeley, Univ. of California Press 1959.

[10]Rot'enberg, S. "Income and Leisure in an Underdeveloped Economy." *Journal of Political Economy*, University of Chicago, Chicago, Illinois, April 1952.

today for some Jamaican communities;[11] and exchanges of labour were more common then than now. Members of the community who went to work on estates were of course hired on a wage basis, and perhaps conformed more closely to the type of the "pure" wage worker than the permanent estate labourer; but this work was peripheral to their main interest, the maintenance of the family enterprise.

The estate worker's relation to his employer was, in a different way, almost as far from being a "pure" wage relationship. The bonds which bind the Barbadian agricultural worker to the planter were even stronger before the abolition in the 1930's of the legal basis of the located "labourer" system. The Jamaican worker was on the whole less closely bound, but to the permanent estate worker (not the man with a cultivation but the landless labourer) and to the indentured Indian labourer the estate was a complete community toward which his allegiance must be directed, with a hierarchy of authorities who exercised over him a control much more immediately important than that of the police or law courts, and within which, so long as he obeyed its rules, his place was secure.

Even in the towns, many of the workers — perhaps most — were domestics, dressmakers and other artisans with a regular clientele, or hangers-on of prosperous families. In all these cases, worker and employer were bound together by much more than simple economic advantage. But there were groups which in various ways fell outside this system — portworkers, with their casual, highly paid but insecure employment; highly skilled workers such as printers; the small but growing number of workers in large industrial establishments where economic efficiency outweighed personal considerations in deciding who should be hired and who fired.

In the 1920's and 1930's the stability of the society of which these relationships formed one aspect was endangered by a number of changes. Some of these — the fall in the sugar price, the curtailment of emigration, the spread of familiarity with new political ideals — were common to the whole West Indies, and help to explain the simultaneity of the unrest which sprang up in all the islands in the late 30's. Others, such as the changes in the organisation of the Barbadian sugar industry and the exhaustion of the supply of new agricultural land in Jamaica, were more limited in their operation. But their general effect in Jamaica and Barbados was to throw more and more of the working population outside the operation of the social system which had traditionally governed the relations of employer and worker. If we consider where labour organisation in the West Indies generally began, we find that orderly unionism sprang up early among the portworkers and certain types of skilled urban worker, while violent labour protests and what one may call the "disorderly" type of West Indian union started among the unskilled labourers who had been displaced from the

[11] Smith, M. G. *Labour Supply in Rural Jamaica*, 1956, Government Printer, Kingston, Jamaica.

social system and left to roam as migrants or to crowd into the new quarters of the cities.

If we are to understand the role which unionism has taken in the West Indies, we must distinguish three ways in which these general changes affected the worker. First, they affected him economically, by diminishing his income and his regularity of employment. Secondly, they affected him emotionally, because the state of proletarianisation, so to speak, in which he found himself was an offence against the social ideals which he had been accustomed to entertain, and implied that society itself had wronged him. Thirdly, because the only conceivable remedies for the state in which he found himself — relief work, better social services, some form of social security — were matters for Government and were unwelcome to the existing Government, the worker was forced into the contemplation of political action.

From the point of view of orthodox unionism (e.g. Major Orde Browne's report),[12] only the first of these problems was the direct concern of trade unions. The third might be entertained so far as it was necessary to provide the legal basis for industrial action, but not for the kind of general social change which the Jamaican or the Barbadian situation called for. The second, the emotional problem, was not the formal concern of a good union at all. If the emotional problem was allowed to influence union operations, or the political problem was allowed to dominate union thinking, it could only be at the expense of the efficiency of industrial action.

In fact the West Indian unions had no choice but to attempt to meet all the needs of the worker in whatever way came to hand. The stress which was laid on one or another problem varied from union to union, from place to place and from time to time. No attempt is made here to give a detailed history of Jamaican and Barbadian unionism; but it is instructive to consider, how that unionism is established and almost of age, how the solutions adopted differ in the two islands.

The situation in Barbados is relatively simple. Here a compact employing group, most of which can be influenced or controlled through two organisations (the Sugar Producers' Association and the Barbados Shipping and Trading Co.) has built up a relationship with a single union, the Barbados Workers' Union. The unity on each side reflects the close integration of the Barbadian economy. This was strikingly illustrated in 1955 when a labour dispute arose between the union and a bottling factory over the dismissal of a union representative. The union's position was initially weak; the man dismissed had violated a work rule, and the union had a very small membership in the factory. It therefore brought pressure to bear by instructing its members among the port-workers to refuse to unload supplies consigned, or likely to be consigned, to the factory. The employ-

[12]Orde Browne, C. St. J. *Labour Conditions in the West Indies.* Cmd. 6070, London H.M. Stationery Office, 1939.

ers' organisation concerned, the Shipping and Mercantile Association, claimed that this was a breach of agreement and proclaimed a virtual lock-out of all port-workers. Thus in a very short time a dispute outside the area of strength of either the union or the employers' group, irresponsibly precipitated by a union official acting in the absence of the effective head of the union, brought the two groups face to face in a deadlock. A face-saving compromise was eventually reached, but not before a ship which had brought lumber to repair the damage caused by a recent hurricane had sailed away with its cargo from the idle harbour. In such circumstances, there is little room for manoeuvre by union or employers, and it is to the interest of both to find an enduring relationship; moreover, this interest can be directly appreciated throughout a small and homogeneous community, so that undisciplined action on either side is relatively rare.

In Barbados the industrial problem — that of raising wages and increasing security — has been solved by carefully negotiated agreements in the major industries. In the sugar industry, for example, the agreement runs for a term of years and includes provision for a bonus on production and for a link between wages and the negotiated price of sugar. Since the Barbadian sugar price is determined by the negotiations of other producers (Barbados accepting whatever is agreed), this agreement in effect guarantees that neither side in the sugar industry will take an initiative or attempt to exploit a bargaining position except at long intervals.

The political problem has been solved by a gradual evolution toward representative government in the full sense — Barbados has never been a Crown Colony, so that its institutions of popular representation had a long tradition; and, by a widening of the suffrage and a transfer of executive power from official nominees to elected ministers, they have been adapted without any great discontinuity to a more popular system. But even in the make-up of a popularly elected House of Assembly the essential balance of power appears; the conservative opposition has never been submerged by the affiliate of the union, the Barbados Labour Party, and the extent to which the idea of a balance between the employer group and the popular party is accepted appears in the nature of the rumours which circulate — that the conservatives could form a Government, but do not really want to; or (quite baselessly) that the leader of the popular party is "in the pay" of the conservatives.

The emotional problem has been solved by the general recognition that its basis — the existence of a system which made the worker dependent on social links with the employer — has been removed by the transfer of the important part of the relationship to the political level where power is clearly evenly balanced. The worker's need for vindication in his demand for higher standards of conduct in the employer still re-appears in the occasional violence of language of union and party leaders. In a sense, too, the transfer of the relation to a political level has been simplified by the

fact that for the greater part of the period since 1938 one man has dominated both the union and the Labour Party — Sir Grantley Adams. He does not hold an official position in the union, and is indeed reported to be on bad terms with the union secretary; but he nevertheless manages to dominate the union policy through henchmen and through his political position. The worker has therefore been provided with a single dominant figure who can both replace the planter in his traditional paternal role and symbolise the negotiating equality of the worker.

In Jamaica the situation is more complex. There is no single organisation which can speak for all employers (an employers' federation has just been formed, but has not yet played an important role in industrial disputes) and much less concentration of economic control, whether by social groups or industries. We have already pointed out the social divisions of the Jamaican employing group. Economic bonds do not on the whole provide links between different industries. The control of the sugar industry, for example, lies for the most part with firms whose interests are wholly in that industry, with occasional exceptions; one large estate is owned by a family who also operate garages, a foundry and other enterprises. It is true that there are cases where mercantile interests have invested in manufacturing (e.g. the biscuit industry), in hotels and other industries. But on the whole employers still negotiate either individually or by industries, and even industry-wide negotiations do not carry the same implications for the whole economy as in Barbados.

The number of unions which have been registered in Jamaica is very large. In practice for most of the period since 1938 the important division is only into two — into a general union, the Bustamante Industrial Trades Union, and a group of craft, industrial and even company unions which were for many years linked as the Trade Union Council of Jamaica and after certain vicissitudes in the years 1954-56 have become merged in the National Workers' Union. It is not easy to draw a consistent distinction between the character of these two organisations nor to distinguish the matters of principle which divide them. They co-operate amicably in certain matters — for example, the island-wide wage negotiations in the sugar industry. It is tempting to regard them as separated merely by political convenience (they are linked with the two major political parties, the Jamaica Labour Party and the People's National Party) and personal rivalry, and to cite the Jamaica situation as an example of the way in which political and personal rivalries weaken the power of the unions for industrial action. But in fact they did, particularly in their early years, represent divergent approaches to the worker's three problems, as we have outlined them above.

The T.U.C. group of unions was in the beginning very conscious of the nature of union organisation in Great Britain, as its choice of name implies. While not orthodox in the sense in which we have used the word above,

it was no more unorthodox than the British trade unions of that time. It gave an important place in its thinking to political action, not merely to meet the immediate needs of the unions for legal protection but also to recreate society along lines more or less socialist, and it became the home of the left wing in Jamaican politics. It also attached importance to formal organisation and the due and democratic election of officers and exercise of control. Its officers were mainly lawyers, small businessmen and white-collar workers. In general, it aimed at solving the first and third of the worker's problems – the industrial and political – by means of a well-thought-out long-term plan. So far as it recognised the emotional problem, it was only in the unpremeditated reactions of its officers to particular situations; indeed most of its officers were not of a social stratum to appreciate the intensity of feeling involved.

The Bustamante Industrial Trades Union, on the other hand, sprang directly out of the needs of the situation in 1938, and did as little systematic thinking and planning as a continuing organisation can well do. It has never had as an aim the kind of transformation of the industrial situation which is part of socialist thinking. On the contrary, it attempted to exploit so far as possible the type of employer-worker relation which existed before 1938, to restore it where it had been changed, and, when restoration was impossible, to meet the worker's emotional needs while palliating the industrial situation by any means available. The union only entered elective politics after the People's National Party, and during its period of power (1944-55) its attitude was consistently conservative. A typical instance was its use of its political position to insist that a local match factory use labour intensive methods in order to provide extra employment. By such action, and by virtue of the commanding personality of Sir Alexander Bustamante, it has been successful in transferring to itself, and so up to 1955 to the Government, the allegiance which under the traditional system the employer had claimed, and the obligation to provide employment which had gone with that allegiance. So far the position was similar to that of the Barbados Workers' Union.

But the B.I.T.U. was not successful, as was the B.W.U., in setting up a negotiating machinery and attaining a bargaining strength which would permit it to meet the obligation it assumed; nor had it among its members, nor did it attempt to cultivate, the pragmatic attitude which in the Barbadian worker led to an intelligent acceptance of the new situation. Hence about 1955 it began to lose ground to the reorganised National Workers' Union, which had deliberately set out to expand its membership among the unskilled labourers who had been the backbone of the B.I.T.U. Since the election campaign which led to the defeat of the J.L.P. in 1955 it appears that the B.I.T.U. has swung toward a more orthodox attitude, while the N.W.U. has taken over some trappings of the opposition – for

example, the cult of the "leader". Hence it is no longer easy to draw clear distinctions between the attitudes of the two organisations. It is certain, however, that so long as Sir Alexander is alive the Jamaican union movement will retain emotional characteristics which can only be understood in terms of the needs of the worker in the years following 1938.

So much for the social content of Barbadian and Jamaican unionism. What have been the economic effects? We have stressed that in Jamaica, particularly, the union has had to meet the workers' emotional needs in a way which is not comprehended in the usual view of a union's legitimate sphere of industrial and political action. The consequence has been that industrial negotiation has been a peculiarly complicated task. Every union is, of course, exposed to non-economic pressures which arise from its mere corporate existence; organizational rivalries, the need to "grandstand" to keep the workers' confidence and interest, and so on. But employers in Jamaica have found themselves forced to attempt to fill incompatible roles, in that the union has tried to exact from them both the things which they should have done as employers under the traditional system and the things which could reasonably be demanded on economic grounds of an employer with full liberty to follow the most profitable policy within the law. For example, sugar producers were pressed to raise wages but also to refrain from mechanisation; the wage demands could easily have been met by technical improvements which would have reduced employment, but to reduce employment was not admissible under the traditional view of an employer's obligations except under very adverse conditions. To take a smaller example, the workers on a Jamaican sugar estate came out on strike because a worker no longer employed on the estate had been evicted from his room in the estate housing. The grievance is only comprehensible under the assumption that the worker is part of the estate as a community, and his privileges are not abrogated by the fact that there is for the time no work for him. Yet a modern industrial enterprise can clearly not be run on this assumption.

Hence it is probable that a disproportionate amount of managerial time has been spent on negotiation at various levels, and labour time has been lost unnecessarily, because of the unclearness of the objectives of the unions. But we should be cautious in putting this forward as a criticism of the union leadership. In the nature of the case, unions in a period of transition are forced to pursue incompatible objectives. The economic losses to the community arising from unnecessary strikes and protracted negotiations are the cost of the adjustment of the social system to a new, and potentially more profitable, pattern of economic activity.

In this section we have described the social background of the Jamaican and Barbadian worker in terms of three institutions — family, class and labour union. We have tried to show that an understanding of these insti-

tutions is helpful to economic analysis of the labour situation, and that while the economic effects of these social influences cannot be put in quantitative terms, they are important enough to warrant an attempt to treat them more systematically than has usually been thought possible.

An Economic View of Agricultural Research in Jamaica

By

D. T. Edwards.

In recent years many references have been made by economists to the importance of an adequate supply of knowledge as a necessary condition for economic growth. Most of their discussion has been in rather general terms.[1] The exceptions are several detailed studies by American economists.[2] This paper explores a different case: the supply of knowledge for the agricultural industry in a newly developing economy, Jamaica. After outlining the history and organization of agricultural research in Jamaica the paper reviews the adequacy of knowledge obtained from experimental work and compares the volume of resources employed in research on various agricultural products. An examination of the conditions under which research is carried out in Jamaica and of some of the problems which obtain leads to a discussion of the element of an appropriate strategy to meet the situation and to the problem of applying the results of research. Some of the main conclusions are brought together at the end of the paper.

The Historical Development of Agricultural Research

The establishment of the first botanical garden in Jamaica in 1774 and the arrival of the first island botanist in 1777 mark the commencement of formal agricultural research in the island, although many exotic plants had already been introduced, first by the Spaniards and subsequently by the English colonists.[3] The island botanist was required

> To collect, class and describe the native plants of the island; to use his endeavours to find out their medicinal virtues; to discover if they possess any qualities useful to the arts, and annually to furnish the House of Assembly with a correct list of such plants as are in the Botanical Gardens, together with such information as he may have acquired relative to their uses and virtues.[4]

[1] Valuable discussions of the supply of knowledge for the agricultural industry have appeared in books by Lewis and Schultz: Lewis, W. A., *The Theory of Economic Growth*. London, George Allen and Unwin Ltd., 1955, Chapter IV; Schultz, T. W. *The Economic Organization of Agriculture*. New York, McGraw Hill, 1953, Chapter VII.

[2] See, for instance Schultz (1953) Chapter VII; various papers by Schultz and by Heady in the *Journal of Farm Economics*, listed in Ruttan, V. W. "Research on the Economics of Technological Change in American Agriculture." *Journal of Farm Economics*, Vol. XLII, No. 4, November 1960, p. 745, footnote 31; Chapters 3 and 13 in Heady, Earl O. *et al* (eds.) *Agricultural Adjustment Problems in a Growing Economy*. Iowa, State College Press, 1958.

[3] Parry, J. H. "Plantation and Provision Ground," *Revista de Historia*, No. 39, 1955.

[4] Morris, D. "Report on the Economic Resources of the West Indies", *Bulletin* of Miscellaneous Information, Additional Series 1 H.M.S.O., 1898, p. 141.

By 1782 neary 600 valuable plants had been introduced and were becoming acclimatized. A century later, 1881, it was possible to write:

> Directly and indirectly during the last hundred years the Botanical Department has been the means of introducing and propagating some of the most valuable plants, now the sources of the staple products of the island, and its work in this respect is being increased year by year...It is a striking fact that with the exception of pimento – 'that child of nature' – and a few others of comparatively little value, most of the staple products of the island are derived from exotics or plants introduced from other parts of the globe.[5]

The same writer, an authority on tropical agriculture, also observed:

> Jamaica possesses possibly the most varied and valuable collections of economic or industrial plants of any tropical country. These have nearly all been introduced from other countries by the Botanic Gardens, and their distribution throughout every part of the island, begun in 1777, has been continued uninterruptedly to the present day.[6]

The Department of Public Gardens and Plantations which controlled the Botanical Gardens was praised also by a Royal Commission, for its good work in disseminating "the knowledge requisite to cultivate the products of the island to the best advantage."[7]

At the opening of the present century, the Government Laboratory, which had been set up in 1870 to undertake medical and judicial analyses, was joined with the Department of Public Gardens and Plantations. The new organization eventually became the Department of Agriculture. Experiments on the cultivation and manuring of sugar cane, bananas, cocoa, coffee and pineapples wers soon laid down in thirty centres representing typical soils in the island.[8] Other research, particularly on sugar cane followed, but more than 30 years later – in 1938 – the position was such that an official report subsequently stated –

> The Department of Agriculture was staffed by a mere half dozen specialist officers, mostly young men recently graduated...The Department undertook responsibility for banana breeding and a number of minor research projects...The Department's facilities for research were meagre in the extreme and having little opportunity for assessing the research needs of the small farmer it tended to recognize only those problems which concerned the main export industries – banana and sugar cane.[9]

Wakefield, the Agricultural Adviser to the Comptroller for Development and Welfare in the West Indies, in his *Memorandum of the Agricultural Development in Jamaica,* assessed the position in 1942 as follows:-

> Agricultural operations in Jamaica are largely based on opinion and traditions instead of on significant data ascertained by scientific investigation. Consequently, the Director of Agriculture has rightly submitted that the most urgent need of his department is the establishment of experiment stations to serve the main ecological regions of the island...The truth is that the Department has never had adequate facilities to carry out a comprehensive programme of experimentation. Until this position is rectified, it will neither be possible to provide the primary producer and the extension staff of the Jamaica Agricultural Society with the

[5]Morris (1898), p. 138.

[6]Morris (1898), p. 131.

[7]Government of Jamaica, *Handbook of Jamaica.* 1901, p. 400.

[8]Government of Jamaica, *Handbook of Jamaica,* (for the early years of the Twentieth Century).

[9]Ministry of Agriculture and Lands, *Agricultural Development since 1938* and the Programme *for 1955-60,* Jamaica, 1954, pp. 3 and 4.

data they require, nor to plan satisfactorily a long-term programme of agricultural development.[10]

The facilities for research in the Department of Agriculture were expanded so that in 1958 the following departments with research responsibilities were in existence: Crop Agronomy, Plant Protection, Economics and Statistics,[11] Agricultural Chemistry, Farm Machinery, Animal Husbandry, Veterinary. (By 1958 the Department, and its various sections, had become part of the Ministry of Agriculture and Lands). Several experiment stations have been established to serve some of the main ecological regions.[12]

Wakefield also supported the idea of research being carried out "by producers' organizations where they are in a position to undertake it, as may be the case in the sugar industry."[13] Since the Memorandum was written, three organizations responsible for important crops have each set up their own research department. The Sugar Manufacturers' Association established their Research Department in 1942 with the help of a grant from Colonial Development and Welfare funds. The Banana Board and Coconut Industry Board set up their research departments in 1956 and 1959. (Experimental work, mainly on the response of yield to fertilizer had been carried out in the early 1950's by the soil chemist of the All Island Banana Growers' Association.) The commodity organizations appear to have set up their research departments because they considered the research done on their respective crops inadequate in volume, range and continuity. On the last point the Coconut Industry Board commented, in recording its conviction that it was imperative for the Board to have its own permanent research organization. "In the past, much money has been expended in bringing out scientists for short periods of research, with inconclusive results. Research on coconuts must be a long-term proposition."[14]

The agricultural research in Jamaica is and has been supplemented for some years by work in other territories of the West Indies. This research is partly financed by local commodity organizations and partly by the West Indian and the United Kingdom Governments. At the former Imperial College of Tropical Agriculture in Trinidad (now the Faculty of Agriculture of the University College of the West Indies) research into sugar technology is conducted, while in Barbados there is a Central Sugar Cane Breeding Station. The research into the technology of sugar production com-

[10]Wakefield, A. J. *Memorandum of Agricultural Development in Jamaica*. Barbados, Development and Welfare Organisation in the West Indies, 1942, p. 22.

[11]Apparently Jamaica enjoyed a central statistical service for agricul ural research much earlier than did many other British Colonial Departments of Agriculture. (Priva e communication: A.M.M. Rees.)

[12]Minis'ry of Agriculture and Lands, *Annual Report* for the Year Ended 31st December, 1958. Jamaica, The Government Printer, 1960.

[13]Wakefield (1942), p. 22.

[14]Coconut Industry Board *Sixteenth Annual Report and Statements of Accounts* For Year Ended 31st December, 1957. Jamaica, (undated), p. 2.

menced in 1947, but the breeding of improved varieties has drawn on continuous work in Barbados dating from 1888, although the West Indian territories began its financial support only in 1936.

Banana breeding was undertaken sporadically in Jamaica, in 1902 and 1916, and continuously in Trinidad from 1922 and Jamaica from 1924.

> During the 1930's it was agreed that fundamental botanical studies were best carried out in Trinidad (at the Imperial College) while practical breeding operations were most appropriate to Jamaica...the natural division of effort was formalised after the second World War by the foundation in 1947 of the Banana Research Scheme.[15]

The work on banana breeding is financed by Colonial Development and Welfare funds, by the Jamaican industry, and by the Cameroons Development Corporation.[16]

The only other formal agricultural research undertaken in Jamaica in addition to that already mentioned is work carried out by the research staff on certain sugar estates. The Scientific Research Council, which has recently been established, may conceivably initiate agricultural research, but its policy has not yet been made public.

Nature of Research and Adequacy of Results

Since at the time this study was being conducted the most recent reports available on agricultural research related to activities in 1957, except in the case of the sugar industry, the review of past work can cover only the activities of the Department of Agriculture and of the Research Department of the Sugar Manufacturers' Association: the Coconut Research Department had not been set up and the Banana Research Department had been established only in the year previous to 1957.

The main functions of the four sections (Botanical, Chemical, Agricultural and Statistical, and Physics) of the Sugar Research Department, as stated in 1953, may be summarised as covering the following fields: the introduction and testing of new sugar cane varieties;[17] the study of sugar cane nutrition and culture including soil management and the use of irrigation water; the study of sugar cane diseases and pests; the collection, analysis and circulation of industry statistics on climate, agricultural production and factory and distillery operations; miscellaneous analytical work required by the industry, liaison with other research institutions.[18]

The industry has been sufficiently impressed with the results of the research undertaken by the Research Department to take over the entire

[15] Simmonds, N. W. *Bananas*. Great Britain, Longmans, 1959. p. 409.

[16] Private communication from Senior Research Agronomist in the Research Department of he Banana Board.

[17] In 1960 it was reported by the Director of the Sugar Research Department "...we...select 40,000 or more seedlings a year..." See *The Daily Gleaner* (The Farmers' Weekly), February 20, 1960, Jamaica, The Gleaner Co. Ltd. p. 3.

[18] Innes, R. F. "An Introduction to the Sugar Cane Agriculture of Jamaica". Paper in *Proceedings of the Eighth Congress of the International Society of Sugar Cane Technologists*, British West Indies, I.S.S.C.T., 1954, pp. 353 and 354.

financing of the Department and to expand the scale of operations. Six of the 20 estates also found it worthwhile to employ a total of eight research agronomists.[19] Evidence of the satisfactory state of knowledge produced by the Department is provided by the favourable judgment of competent and impartial bodies such as a Mission of the International Bank for Reconstruction and Development,[20] by the bodies responsible for the banana and coconut industries modelling their research departments on the sugar industry's, and by the absence of suggestions by Commissions of Enquiry that considerably more research is required to allow the industry to become more efficient.[21] Perhaps the favourable position is not surprising: the research is conducted by very capable scientists, working as a team on a programme which is continuous and is devised with the help of representatives of the main users of the knowledge produced, on whose lands the experiments are largely conducted. The monoculture of sugar cane avoids the complications introduced into experimental work by mixed cropping while the management and natural conditions on the estates seem to be appreciably less heterogeneous than the conditions surrounding the production of many other crops in Jamaica. Such features combine to facilitate and to ensure the usefulness of research into the production of sugar cane.

The Sugar Research Department extended its activities in 1957 to include work on cattle. "The setting up of a Livestock Scheme for sugar estates was approved [during the year] by the Directors and Members of the Sugar Manufacturers' Association (of Jamaica) Ltd., whereby up to three veterinary officers would be employed for a period of three years initially, and thereafter directly by Members of the Association with cattle interests, possibly partnered by other large cattle owners outside the sugar industry."[22] "During the first year of the operations of the Scheme, much time has of necessity been devoted to discussion with managements and directors on matters of general policy and on development programmes."[23] But some trials were also undertaken and several long-term research studies were commenced.

In spite of the impressive range and volume of work carried out by the research staff of the Department of Agriculture (now the Ministry of Agriculture) during more than half a century, some subjects have received virtually no attention, and others are represented only by results which are quite inadequate whether as a basis for national policy or advice to in-

[19]British West Indies Sugar Association, *1958 Handbook*, p. 62.

[20]International Bank for Reconstruction and Development, *The Economic Development of Jamaica*, Baltimore, Johns Hopkins Press, 1952.

[21]The Annual Reports of the Sugar Research Department bear witness to the tremendous volume of field experimentation carried out by the Department since its inception. See for instance Sugar Manufacturers' Association's Research Department, *Annual Report, 1957*. Jamaica, (undated), p. 2, para. 16.

[23]Sugar Manufacturers' Association's Research Department *Annual Report, 1958*, Jamaica, (undated), p. 28.

[22]Sugar Manufacturers' Association's Research Department (*Annual Report, 1957*), p. 1.

dividual producers. This conclusion, which may be arrived at by informal means, is also borne out by a review of (i) the inventory of experiments for which the results are available on file in the Division of Economics and Statistics of the Ministry of Agriculture and Lands; and of (ii) the experiments on livestock reported in the Research Bulletins and Annual Reports of the Ministry. (The limitations of these sources of information are discussed in the Appendix to this paper.)

A review of the experimental work on crops (other than grass and cover crops) up to the middle of 1959 leads to the following conclusions:

1. Research has been undertaken on a large number of crops providing human food — more than forty. Even so, some crops of appreciable importance have not been the subject of research. An interesting example is the ackee, which is largely consumed in the island, though small quantities are canned and exported to Britain and America. There is likely to be a substantial export market for this crop, but any attempt at large-scale production would have to be carried out with little formal knowledge.[24]

2. Despite the research undertaken on crops, the results are commonly most inadequate in relation to the knowledge needed. We may distinguish two groups of crops: those on which very few experiments have been undertaken by the Ministry of Agriculture and Lands, and those subject to many experiments. Naturally little formal knowledge is available for crops in the former group — except for sugar cane, which has been the subject of a considerable research programme by the Sugar Manufacturers' Association through its research department. In some few cases a single experiment was adequate because it demonstrated that the crop involved cannot grow under Jamaican conditions. Nine crops account for 202 of the 267 experiments recorded for crops in the register. Assessments of the adequacy of data are available for the crops subject to the highest and third highest number of experiments, banana (45) and citrus (32). Together the two crops account for between one-third and one-quarter of the total number of experiments.

The recent Commission of Enquiry into the Banana Industry of Jamaica took more than ten paragraphs to state, concisely, the knowledge required by the Banana Industry which should be obtained by research,[25] while the scientific team appointed to investigate the research needs of the citrus industry in the British Caribbean area drew attention to the great volume of research work needed in four major fields.[26]

3. Of the 267 experments on crops, 110 involved variety trials and 64 fertilizer experiments. The high proportion, about 65 per cent, of the

[24]See *The Daily Gleaner*, (The Farmers' Weekly), February 6, 1960, Jamaica, The Gleaner Co. L'd. p. 3.

[25]*Report of the Commission of Enquiry into the Banana Industry of Jamaica, 1959*, Jamaica, The Government Printer, 1959. Vol. 1, pp. 43-44.

[26]Wallace, T., Camp, A. F., Hinton, H. R. *Report* of Scientific Team Appointed to Investigate the Research Needs of the Citrus Industry in the British Caribbean Area. Cyclostyled, 1958, p. 2.

experiments on these two subjects draws attention to the rudimentary nature of much of the research and, conversely, to the limited proportion of research devoted to the wide range of other possible topics.

Despite the concentration on fertilizer response experiments, several authorities have declared the information to be inadequate. In 1952 the International Bank Mission to Jamaica wrote:

> Extensive work should be done on the response of various crops to fertilizers. The Sugar Manufacturers' Association has shown how much can be achieved through applied research and experimentation in this field, but comparatively little has yet been done to determine the proper applications of fertilizers for other crops.[27]

More recent comments on the need for information on yield response to fertilizer by various crops indicate that the overall state of knowledge is generally unsatisfactory.[28]

Some of the topics not studied constitute a remarkable omission. Perhaps the most striking is the lack of systematic long-term studies of soil erosion and soil conservation measures – such as those initiated in Trinidad in 1952 and 1954.[29] Another notable omission is that of experiments on mixed cropping, which in 1958 accounted for 54 per cent of the total cultivated area in Jamaica.[30] This is just one example, from amongst many possible, of the failure to tackle complicated "farm" problems. In fact, apart from some notable exceptions, little attention has been paid to the interaction of practices, except at the simplest levels, despite the subject's great importance. Further, virtually no breeding work was recorded and little has been done, which means that Jamaica relies mainly on variety trial and selection to choose from amongst native and imported varieties. Not surprisingly the research was entirely "applied" rather than "basic" or "fundamental" research.

The register of experiments also contains information on pasture investigations: the 33 completed experiments cover several species and subjects. The largest number of experiments on any one topic is 9 on response to fertiliser application, but the older experiments in this series have been so severely criticised by competent authorities that their value must be doubted.[31]

The overwhelming part of livestock research in Jamaica has been devoted

[27] International Bank of Reconstruction and Development (1952), p. 62.

[28] See the following: *The Daily Gleaner* (The Farmer's Weekly), August 16th, 1958, Kingston, p. 1; Moss, R. I. *A Guide to Coffee Culture in Jamaica*. Jamaica, The Government Printer, 1956, p. 51; Wallace, Camp, Hinton (1958), p. 30; *Report of the Commission of Enquiry into the Banana Industry of Jamaica, 1959*. (1959), Vol. 1, p. 43; International Bank for Reconstruction and Development (1955), pp. 62, 201-202; Vernon, K. C. *Soil and Land Use Surveys No. 4*, Jamaica, Parish of St. Andrew, Trinidad, I.C.T.A., 1959, p. 23; Ministry of Agriculture and Lands, *Investigations 1956-1957, Bulletin No. 57 (New Series)*. Jamaica, The Government Printer, 1960, p. 52.

[29] Department of Agriculture, *Research Investigations 1950-56*: Technical Bulletin No. 1. Trinidad, Yuille's Printers, (undated), pp. 114-118.

[30] Department of Statistics, *Agricultural Statistics 1958, 1959*, Jamaica, 1961.

[31] See International Bank for Reconstruction and Development (1952), pp. 171-175.

to producing new dairy and beef breeds of cattle suited to Jamaican conditions.[32] Such breeding work takes years to complete. Work commenced in 1910[33] but "The actual development of a new dairy breed began only in 1943 and the new breed (Jamaica Hope) was named only in 1952." In 1956 "For the first time the herd at Bodles reached its maximum numbers and it...(was then) possible to cull for production and conformation."[34] Large numbers of animals are required; for instance in 1955, the Department had 914 head of cattle,[35] mainly for the development of three new breeds.

In addition to the cattle breeding and pasture research, work has recently commenced on animal nutrition. Formal research into livestock other than cattle has been slight: though some valuable investigational work has been done on pigs and poultry. Research into livestock diseases has been undertaken on only a small scale due to the more pressing nature of routine work and the limited resources available.[36]

This brief review of experimental work has shown that some products have been the subject of considerable though varied amounts of research, while others have attracted little attention. The explanation of the varied distribution of effort which the products attracted is not a single one. Amongst the relevant considerations have been the following: (a) the scale of production units and the form of organization of the producers of the different products; (b) the importance of the products in the farming systems; (c) the attention drawn to the product by dramatic reverses, both biological (in the form of disease) and economic (through a rise in the cost of labour); (d) the possibilities of useful research as revealed by investigations in other countries; (e) the interests of the research workers involved.

Extent of the Research Effort

The impracticability of evaluating the extent of the research effort directly makes it necessary to use some indirect measures, such as volume of expenditure and number of research staff. Figures have been compiled which give the order of magnitude of expenditure on research, whether conducted locally or abroad into problems connected with the various products. (See Table 1.) These figures overstate the expenditure on research on "All other products" because a considerable part of these funds

[32]Ministry of Agriculture and Lands, *Annual Report* for the Year Ended 31st December, 1957, Jamaica, The Government Printer, 1959, p. 47.

[33]Ministry of Agriculture and Lands (Animal Husbandry Division) *Fifty Years of Cattle Breeding and Development*. Jamaica, Government Public Relations Office, (1960).

[34]Department of Agriculture, *Annual Report* for the Year Ended 31st December, 1956. Jamaica, The Government Printer, 1958, p. 45.

[35]Department of Agriculture, *Annual Report* for the Year Ended 31st December, 1955, Jamaica, The Government Printer, 1956, p. 43.

[36]See the Annual Reports of the Department of Agriculture for the past few years.

which are provided by the Ministry of Agriculture and Lands, is not expended on research but rather on development and advisory work, while experiments conducted on private farms provide only a small subsidy. In contrast, the expenditure on research conducted by the Sugar and Banana Producers' Organisations is understated by the omission of the very substantial research costs carried by the estates and properties on which many experimental plots are located and by the omission of the costs of private research on the six sugar estates. Even so, the estimates are useful; they show that well over £118,000 was spent on research involving sugar cane grown on estates and on bananas, and well under £223,300 was spent on research relating to all other agricultural commodities, both crops and livestock. Thus the average research expenditure on the very many products of Jamaican agriculture (other than sugar cane and bananas) is very low.

The comparison is made even more pointed if the expenditures are related to the value of production of the relevant products, as is done in Table 1. If allowance could be made for the overstatement of expenditure

TABLE 1—EXPENDITURE ON AGRICULTURAL RESEARCH BY PRODUCT AND VALUE OF PRODUCTION OF THE PRODUCTS. IN AND FOR JAMAICA: A RECENT YEAR.

£.1

Product	Expenditure on research*	Value of Production**	Expenditure per one million pounds worth of production
Sugar Cane (estate)	>70,600	5,350,300	>13,195
Banana	>48,000	3,774,700	>12,716
All other products	<223,300	21,811,700	<10,238
All Products	341,900	30,936,700	11,052

* See the Appendix for notes on the compilation of these estimates.

** These figures relate to 1958: they are 'ex-farm' values with an allowance made for subsistence production. These estimates were made available by the National Account Statistician, Department of Statistics, Jamaica.

on research on "All other products" and for the understatement of research expenditure on sugar cane and bananas, the rate of expenditure on banana research as well as on sugar cane research, in relation to the value of production, would be seen to stand substantially above that on all other agricultural products, as a group: possibly two or even three times as great.

Further light is thrown on the relative intensity of research into the production of different products by reference to the deployment of qualified research staff within Jamaica. These figures – in Table 2 – again illustrate the disproportionate volume of research on sugar cane and banana, and the comparative neglect of research on the very large number of other crops.[37] (Sugar cane accounted for 25 per cent of the cultivated area in

[37] The disproportionate emphasis of research staff engaged on sugar cane and bananas would be accentuated if account were also taken of the few workers abroad who were financed from Jamaica.

1958-59, and banana for 26 per cent, while all the other crops occupied the remaining 47 per cent of the cultivated area.)[38]

TABLE 2—Distribution of Research Workers and of Value of Production by Products: Jamaica, a Recent Year.

Product	No. of Research Worker Equivalents	Proportion of total engaged on each product	Value of production of product as a proportion of the value of total production
		(%)	(%)
Sugar Cane (estate)	14	35	17
Banana	7	17	12
Other Crops	11	28	52
Livestock	8	20	19
All Products	40	100	100

Before considering questions about the appropriate volume of research and the direction it should take, the conditions under which research has been carried out need to be examined. The feasibility of changing the conditions can be assessed and, where changes seem impracticable, principles can be suggested which if followed would allow research to be realistically accommodated to the immutable conditions. The relevant conditions may be considered in two groups; those arising from the natural features of the island and the farming systems practised, and those stemming from the side of research itself. The former include: the wide range of natural conditions, the great variation in natural conditions from year to year, the large number of different crops and livestock, the great range of cultural practice, and the wide range of managerial ability.[39] The significance of the wide ranges of the conditions involved is that they cause the volume of experimental work necessary to take adequate account of their effects to become very great.

Conditions Under Which Research Is Conducted

Natural Conditions

At least 55 soil types occur in Jamaica:[40] they exhibit a very wide range of characteristics. Even a single crop, sugar cane, is grown on a wide range of soils. As the Director of the Sugar Research Department writes:

> Because of the Geological considerations, the range of sugar cane soils encountered in Jamaica is much more extreme than elsewhere [in the British West Indies?], and especially so is this the case if the cane farmers' areas are included since the latter are largely on steep, eroded hillsides derived from volcanic, sedimentary

[38]Department of Statistics (1961).

[39]For a simple illustration of the effects of these conditions under American conditions see Woodworth, R. C. "Organizing Fertilizer Input-Output Data in Farm Planning". Chapter II in *Methodological Procedures in the Economic Analysis of Fertiliser Use Data*. Edited by Baum, E. L., Heady, E. O. and Blackmore, J.) U.S.A., Iowa State College Press, 1956.

[40]Steele, J. G. *Report* to the Government of Jamaica on Soil Conservation and Land Classification. Rome, F.A.O., 1954, p. 13.

and metamorphic rocks. The range of soil conditions met...is therefore extreme as also is the variation in response to phosphatic fertilisers.[41]

Farming is practised under a considerable range of altitudes, from sea-level up to 5,000 feet—out of an altitude range of 7,400 feet for the island. The average annual temperature falls from about 80-86 degrees at sea level to about 65-70 degrees at 5,000 feet.[42]

Amount of rainfall—which is commonly the main limitation on plant growth—is far from uniform over the island. Even in the areas where farming is carried out, the range is from 30 inches per year to over 120 inches per year.[43] The far from widespread use of irrigation further complicates the situation.

Steele identifies 27 soil areas in Jamaica, and in all of these, except two or three, agricuture is practised. All these soil areas occupy significant acreages: even the most restricted accounts for more than half of 1 per cent of the island's area. Although knowledge of the relative extent of the soil areas is useful, because the areas represent the main sets of ecological conditions of the island[44] their use tends to suggest a simpler natural environment than actually obtains for the areas generally contain two or three different soils, often with very distinctive qualities.

Year to year variations in natural conditions take the form of differences in winds (sometimes accompanied by low temperatures), in rainfall, and in the incidence of pests and diseases of various kinds. In some years little damage may be caused by winds, while in others considerable damage may result because the winds are of high velocity or because they are "Northers", carrying cold air which damages plant tissue. "Northers" blow every few years on average, while 37 hurricanes have struck the island in the three centuries ending in 1951.[45]

Great year to year variations in rainfall commonly occur. Rainfall is frequently excessive to agricultural requirements (at least, for some months in the year) and causes soil erosion, water logging of the soil and even flash floods; while insufficient rainfall is common too, causing droughts of greater or lesser severity. The rainfall for three recent years is set out, month by month, in Table 3. Points to note are not only the appreciable monthly variation (even between 1956 and 1957 when the total rainfall for the years was so similar) but also the occurrence of months when rainfall fell short of or exceeded two inches per month—the level usually assumed to be required for satisfactory plant growth under Jamaica conditions.

41Innes, R. F. "The Inorganic Fertiliser Practices of the Principal British Caribbean Sugar Producing Territories" (in *Proceedings of the Eighth Congress of the International Society of Sugar Cane Technologists*). Jamaica, Executive Committee of the I.S.S.C.T., 1954, p. 160.

42Brennan, J. F. *Meteorology of Jamaica*. Jamaica, The Government Printer, 1936, p. 2.

43Private communication from C. W. Hewitt, Agricultural Chemist, Ministry of Agriculture and Lands.

44Steele, (1954), p. 32.

45Colonial Office *An Economic Survey of the Colonial Territories, 1951*: Volume IV, The West Indian and American Territories, Colonial No. 281-284. London, H.M.S.O., 1953, p. 116.

TABLE 3—RAINFALL ON A SUGAR ESTATE: JAMAICA, 1955-57

Inches

Month	1955	1956	1957	Average—1955-57
January	0.64	0.39	0.11	0.38
February	1.96	2.32	1.08	1.79
March	0.38	2.53	1.77	1.56
April	0.79	0.82	1.37	0.99
May	1.50	0.61	7.05	3.05
June	10.53	2.03	2.73	5.09
July	5.67	3.16	0.82	3.22
August	4.98	0.15	0.28	1.80
September	6.60	1.80	4.16	4.19
October	3.51	9.84	6.14	6.50
November	1.80	1.47	0.06	1.11
December	2.07	0.59	0.21	0.96
Year's Total	40.43	25.71	25.78	30.64

Source: Sugar Manufacturers' Association's Research Department (Annual Report for 1957), p. 4.

Characteristics of Agriculture

Jamaican agriculture is based on a large number of crops and on a few classes of livestock. Although (in 1958) livestock accounted for 19 per cent of the total value of production, and sugar cane and banana together for a further 29 per cent (excluding sugar cane produced outside the estates), 10 crops each provided at least 1 per cent (out of the remaining 42 per cent) of gross agricultural output and a further 8 provided more than one-half per cent but less than one per cent. Numerous other crops are grown on a smaller scale and in aggregate account for a significant part of total production.[46] Nor is this the whole story from the point of view of the experimental agronomist: many of the individual crops are each represented by several varieties which may respond differently to experimental treatments. The presumptions must be that they may act differently until the contrary has been proved.[47]

Appreciable proportions of the experimental activity devoted to sugar cane and banana have perforce been devoted to investigating the effects of varietal differences. Some few crops, such as coffee, are grown commercially in only one variety, but the numerous food crops occur in many varieties. Thus a recent study of the island's cassava has led to the identification of 49 cultivated varieties.[48] Informed estimates put the number of yam varieties grown at between 15 and 20, and the number of coco

[46] Private communication from officer in charge of National Accounts Statistics, Department of Statistics.

[47] This has occurred in at least one case in the sugar industry. The industry has undertaken sufficient research for the conclusion to be reached: "Experimentation has so far revealed no significant interactions between varieties and level of nitrogen application. This suggests that little or no differences exist in the nitrogen requirements of the varieties tested." Innes (1953), p. 158.

[48] Private communication from D. C. Webster, Food Crop Agronomist, Ministry of Agriculture and Lands.

varieties at about 20.[49] Only one feature redeems the large number of varieties of these root crops from the investigator's point of view: considerable scope is provided for selection. This is particularly advantageous because vegetative reproduction of these food crops is easy while crossing by sexual reproduction is very difficult.[50]

Cultural practice in Jamaican agriculture is far from uniform. The large properties generally employ recommended practices to a far greater extent than do the small farms, though there is considerable variation within the group of larger producers.[51] Unless experiments are designed to take account of, say, practice on small farms, they can give misleading results for the small farm conditions. An excellent example of this is provided by experience gained in recent years in the use of fertilisers on corn.

Experiments conducted in 1953 (in the parish of St. Ann) showed an increase in yield of corn of 83 per cent as the result of the application of a complete dressing of fertilizer: the average yield per acre rose from 1,536 to 2,816 pounds. Net returns were also increased. Demonstration plots on nine farms, averaging 25 acres in extent, in the same parish showed even greater relative increases in yields (185 per cent) as a result of applying fertilizer: the increase was from 373 to 1,063 lbs. However the net returns were lower for the fertilized than for the non-fertilized demonstration fields. The explanation of the disparity in the response of net returns between the two cases is largely to be found in the far higher standard of practice employed in the formal experiments than in the demonstrations. In the former case the prescribed practices for the selection of land, spacing, cultivation, type of seed, and so on, were followed, while in the latter case the nine small farmers' ordinary (technically poor) standard of cultivation was employed, except that fertilizer was applied to one-half the crop.[52]

Another complicating feature of Jamaican agriculture is that there is a wide range in managerial ability which is reflected in the varying success in the conduct of given enterprises, as well as in the preference for different practices. The variation in managerial ability is not easy to measure, but its existence is a matter of common experience.

Yet another element which should be taken into account is the wide variation in other resources available to the farmers. Farmers with relatively limited resources may not find it worthwhile employing practices which farmers with less limited resources consider profitable: the appro-

[49]Private communication from D. C. Webster, Food Crop Agronomist, Ministry of Agriculture and Lands.

[50]See Gooding, H. J. "Some Problems of Food Crop Improvement in the Caribbean with Special Reference to Starchy Tubers." Jamaica, *West Indian Medical Journal*, Vol. 7, No. 4, December 1958, pp. 264 and 265.

[51]See for instance: Department of Statistics *Survey* of Sugar Cane Production of Registered Cane Farmers, 1954/55, Jamaica 1956, Department of Statistics *Report* on Citrus Production Survey, 1955/56 Crop Year. Jamaica, 1957.

[52]These data were supplied by the Ministry of Agriculture and Lands.

priate intensity of resource use varies with the supply of resources. The range of quantities of resources employed is very wide in Jamaica. Thus, the average value of capital per sugar estate on nineteen estates with an average area of more than 1,000 acres was about £719,000,[53] while the average value of capital on 27 small farms of average area 9 acres, was £910.[54] Many small farms have even less capital invested.

Features of Government's Research Activity

Turning from the problems provided by the subject matter of research to the consideration of research activity, one is again struck by the magnitude of the problems.

Jamaica is a small, not very advanced country. From the point of view of research the shortage of trained people is just as serious as the limited wealth of the country. Thus not only has the volume and nature of past research fallen short of what one would now regard as desirable, but the problems of expanding its volume are formidable. It seems, too, that institutional arrangements within Government may not offer the best incentives to attract and hold good men. The organization of the Ministry of Agriculture is such that the possibility of promotion seems far less for the research officer than for the extension officer, for the number of senior posts open to an extension officer is appreciably larger than the number open to a (specialized) research officer. While the existence of distinct departments and divisions allows, but does not encourage co-operation between workers from different disciplines, even though a particular problem might benefit greatly from being subject to a combined attack.[55]

What of the quality of the existing research staff? Have they the characteristics and experience which are necessary for successful research? They certainly have a knowledge of Jamaican conditions and most of them have had specialized training in research. But one gets the impression that some of the officers, at least, are in their outlook essentially "general agriculturists" or "extension men" rather than scientists working on agronomic problems. One wonders, too, whether the research undertaken is generally directed in the most appropriate way; the freedom of individual workers to choose their research problems may be a luxury Jamaica cannot afford.

The research officers are beset by various limitations including the shortage of suitable assistants and the distractions of development work. The reports of research in the Research Bulletin contain not infrequent refer-

[53] *Report* of the Commission of Enquiry on the Sugar Industry of Jamaica. Jamaica, The Government Printer, 1960. pp. 70-73.

[54] Edwards, D. T. *An Economic Study of Small Farming in Jamaica.* Jamaica, Institute of Social and Economic Research, 1961.

[55] This weakness has recently been recognized, and an attempt is being made to form inter-divisional teams. (Personal communication from Director of Crops and Soils Division of the Ministry of Agriculture and Lands.)

ences to failures due to normal natural causes[56] or to damage due to inadequate supervision. The latter, unlike the former, is wasteful and could be greatly reduced by the use of better assistance. The disadvantage of the research worker having to concern himself with say the production of planting material for general distribution has been recognized officially, so that in the case of cocoa an officer has been made responsible for propagating cocoa cuttings, leaving the senior officer to concentrate on research.[57] Further limitations on effective research are that agronomists have often been obliged to spread their time for research over too many products and that it has not always been possible to ensure continuity in work on particular research projects. For these and other reasons a substantial proportion of completed research work conducted by the agronomists is never reported on in full, and some of the work is never reported on at all.

A Strategy for Agricultural Research

In view of the conditions obtaining in Jamaica, what strategy of attack on the supply of more knowledge is appropriate?

Consideration of the modest economic position of the country and the the many competing demands on Government's resources suggest that the Government would be wise to encourage strong commodity organizations to undertake research themselves. This approach would have the advantage not only of reducing pressure on Government's resources but would also give the research concerned a close contact with the "felt needs" of the consumers who would employ the research staff, and so ensure that the work performed would be relevant and conducted with dispatch. Even with such an approach, it seems unlikely that in the near future more than two new commodities—citrus and cattle—will be the subject of research by their commodity organizations,[58] though the coffee, cocoa and pimento industries could probably finance a substantial part if not all of the necessary local research on their products. As pointed out above, the sugar industry has already initiated research involving cattle on sugar estates and on land owned by a bauxite company.[59]

[56]Because of the banana crop's susceptibility to wind damage which occurs frequently in Jamaica, the former banana agronomist of the Ministry of Agriculture reports (in a private communication) that only one of many experiments conducted by him lasted for as long as four years. In all the other cases damage from natural causes, mainly high winds, brought the experiment to a premature close.

[57]Personal communication from the Director of Crops and Soils Division of the Ministry of Agriculture and Lands.

[58]Nichols, F. P. B., *The Organisation of the Citrus Industry in the British Caribbean: An analysis with Special Reference to Marketing*. Jamaica, (I.S.E.R., U.C.W.I.), typescript, November 1960. pp. 18 and 19.

[59]Alumina Jamaica Limited, a large bauxite mining company joined the Sugar Industry's Livestock Scheme in its second year, increasing the livestock numbers involved by about one quarter. See Sugar Manufacturers' Association's Research Department *Annual Report* 1958.

The volume of research required which would have to be financed through Government would still be extremely great, even if all the strong commodity organizations did what could be expected of them.[60] The problem could be attacked in several ways. By increasing the volume of resources devoted to research, by choosing the kinds of research which most deserve attention, by ensuring research is of high quality, and by making full use of research conducted outside Jamaica. Jamaica's sudden discovery in 1956, of its relatively backward position in coffee culture illustrates that foreign experience has not always been fully used.[61] Blind spots such as these can be avoided by combing the literature, directly or through abstracts, corresponding with research workers abroad, making visits to other countries and encouraging visits by foreign workers to Jamaica.[62] In this connection the maintenance of a good library and training research men to speak certain foreign languages would be sound investments.

Physical and economic conditions in other countries do not have to be identical or even very similar for their knowledge to be useful to Jamaica. At the same time, findings from research in other countries cannot safely be applied widely in Jamaica until they have been properly tested. The recent history of the pineapple industry provides an excellent example of the danger of placing reliance on an untested innovation. Following the Second World War, Jamaica recognized the opportunity offered by the world shortage of canned pineapple. In 1950 a mission from Jamaica

> ...visited Florida to investigate the most suitable varieties for canning and to locate sources of available planting material. As a result of the visit, suckers of the Natal Queen and Red Spanish were imported for observation. Subsequently it was proved that the local Bull Head variety and the imported Red Spanish are identical varieties...As a result of the mission's visit to Florida, it was recommended that for the future development of the pineapple industry in Jamaica, growers should concentrate on two varieties only, the local Red Spanish (or Bull Head) and the Natal Queen from Florida.[63]
>
> As a direct consequence of the decision to base the development of the pineapple industry in Jamaica on the Bull Head and Natal Queen varieties, the efforts of the Department [of Agriculture] were concentrated mainly on multiplication of these varieties...[64]

But while "the demand for suckers of the Red Spanish (Bull Head) variety was very great and farmers obtained such supplies as they were

60Lewis has observed that this is a common state of affairs in underdeveloped countries. See Lewis (1955), pp. 175-176.

61*The Daily Gleaner*, October 29, 1956. Jamaica, The Gleaner Co. Ltd., p. 24. *The Daily Gleaner, (The Farmers' Weekly)*, November 3, 1956. Jamaica. The Gleaner Co. Ltd., pp. 4 and 7.

62Consequent on the discovery of Jamaica's backward state of coffee culture, tours by representatives of the industry to the more progressive, Central American countries have been productive of new and valuable ideas. While the visit of the Wallace, Camp and Hinton team to the Jamaican citrus industry provides an example of the great contribution which can be made by the visit of foreign workers.

63Department of Agriculture, *Investigations 1950-51*. Jamaica, (undated) p. 126.

64Department of Agriculture, *Investigations 1952*. Jamaica, (undated) p. 92.

able from all available sources,"[65] the demand for suckers of the Natal Queen variety was poor.[66]

The farmers' aversion to growing the new variety for canning was fortunate because under Jamaican conditions the fruit produced was too small for canning.[67]

In some cases merely trying out an innovation under normal experiment station conditions is adequate as a test. (When the undistributed Natal Queen suckers produced fruit, the unsuitability of the variety for producing fruit for canning was immediately obvious.) But in other instances the test is adequate only if ordinary farm conditions prevail—which are not easy to simulate on experiment stations.

The three remaining ways of increasing the amount of useful research can be conceived as different dimensions of the problem, for they are interrelated. Thus an increase in the volume of research and the choice of appropriate lines of work cannot make their greatest possible contribution if the quality of research—the way in which it is conceived and executed—is poor. In a sense Jamaica needs research of even higher quality than that obtaining in economically more advanced countries just because Jamaica is relatively backward, and because the volume of research that can be devoted to the host of problems is relatively small. Two or three poor research workers represent a tremendous sacrifice of opportunities. A similar argument justifies adequate facilities being provided, including an atmosphere conducive to research.

There seems no doubt that the value of agricultural research in Jamaica would be greatly improved as long as the following conditions were satisfied: projects are well chosen, the research work is of high quality and the consumers (from national policy-makers to individual farmers) are likely to make use of the findings. It is not proposed in this paper to suggest just how great the volume should be since, as suggested above, this would depend on conditions which cannot be foreseen in detail by this writer. But it may be useful to consider the problem.

Volume of Research

W. A. Lewis has suggested on the basis of American and British experience that expenditure on agricultural research at the rate of about one-half of one per cent of the net value of agricultural output represents a desirable level.[68] Stressing the tentativeness of such a standard, Lewis wrote: "There is no firm basis for such a suggestion. All the same, current expenditures, which do not reach a fraction of this level, are clearly too

[65]Department of Agriculture, *Annual Report* of the Year ended 31st December, 1953. Jamaica, The Government Printer, 1954, p. 27.

[66]Department of Agriculture, (1952), p. 27.

[67]Agricultural Development Corporation Fifth *Annual Report and Statement of Accounts* for Year ended 31st March, 1957, Jamaica, The City Printery, (undated), p. 16.

[68]Lewis (1955), pp. 176 and 188.

low."[69] Around the year 1959 Jamaica was spending (very approximately) at the rate of one point four (1.4) per cent of the value of net agricultural output:[70] that is at about three times the standard rate suggested by Lewis. Even allowing for an appreciable discrepancy in the basis for compiling the expenditure figures the Jamaican ratio is still surprisingly high. What conclusion can be drawn? Certainly not that Jamaica is spending too much on research. There are several reasons why Jamaica might be expected to spend at a higher rate than does Britain or America. Jamaica has a much more limited foundation of firmly established knowledge relevant to its conditions on which to build than do the two advanced countries. Since the research effort cannot be effectively conducted below a certain scale, a relatively small agriculture, such as Jamaica's, is likely to require research expenditure at a higher rate on that ground too, than do the far larger agricultures of Britain and America.[71] Also working in the same direction is the extreme diversity of products and the most varied and variable natural conditions which characterise Jamaican agriculture.

Assessment of the value of agricultural research and education in the United States of America has shown the productivity of such investment to be so great that it seems reasonable to suppose that as long as the research is well conceived and executed and the findings taken up by the general body of farmers, considerably more than the prevailing level of resources employed could be profitably invested in research.[72] A more persuasive argument for increasing investment on agricultural research under Jamaican conditions derives from the example of the local sugar industry. Here is an industry which watches its expenditure on research closely:[73] but has over a period of twenty years increased its research expenditure considerably, up to its present relatively high level. Since the research in this industry is efficiently conducted and profitable it can be used as an appropriate standard for indicating an order of magnitude for investment in research on other products of Jamaican agriculture.

If recurrent expenditure on research for Jamaican agriculture as a whole had (in 1959) been at the same rate (in relation to production) as was the apparent expenditure on (estate) sugar cane research, the total expenditure for the island would have been more than £408,000 instead of about £342,000 – an increase of more than £66,000 or 19 per cent of the estimated total expenditure, and an increase equal to more than 20 per

69Lewis (1955), p. 176.

70Estimated from Table 1 above and from estimates of net domestic product at factor cost, for the agricultural industry (£24,534,000 for 1959), supplied by the National Accounts Unit of the Department of Statistics.

71In 1959 the value of gross domestic product of agriculture, forestry, fishing and hunting at current factor cost was £28m. in Jamaica as compared with £874m. in the United Kingdom and £5,780m. in the United States of America. See United Nations *Yearbook of National Account Statistics*, 1960, New York, 1961. p.p. 130, 228 and 236.

72For references to American studies see Ruttan (1960), pp. 745-747.

73*The Daily Gleaner*. February 15, 1960, Jamaica, The Gleaner Co. Ltd., p. 19.

cent of the estimated expenditure on research other than on sugar cane.

Another basis for gauging the increased research effort required is provided by the number of research worker equivalents associated with a given value of production in the (estate) sugar industry. On this basis a total of 81 scientists would be required instead of 40, an increase of 41 to supplement the 26 scientists engaged in research on products other than sugar cane. (If the additional scientists involved additional expenditure at the level associated with a scientist engaged on research other than on sugar cane, the increase in expenditure would probably be rather less than £428,000—an increase of rather less than 158 per cent of the expenditure on products other than sugar cane in 1959. If the increase in expenditure was at the apparent level associated with scientists in sugar cane research in 1959, the figure would be in excess of £205,000).

These calculations indicate the desirability of increasing the research by a substantial amount on products other than sugar cane. What are the implicit assumptions? That the investment in research by the Jamaican sugar industry is highly profitable and that the investment in research on other products at a similar rate in relation to production is likely to be equally profitable. This basic assumption may be broken down into its economically relevant elements which relate to the following: lines and execution of research; transmission of the findings to the consumers; prospects for the products; and the opportunity cost of the resources employed in research. Unless these elements for research on products other than sugar cane individually, or at least in their aggregate effects, match or are more favourable than the same elements referring to sugar cane research, then the argument for increasing the volume of research on the other products is so much weaker. In practice what help are such considerations? It seems that the fourth element can be disposed of without difficulty since it is reasonable to believe that the opportunity cost of resources used in research on products other than sugar cane is unlikely to be more than the opportunity cost of similar resources used in research on sugar cane. The significance of the first three elements is to emphasize the need for research of high quality and for it to be closely related to the circumstances which obtain and are likely to obtain. The commodity associations for bananas and coconuts have had sufficient confidence in the profitability of research on their products, employing the organizational approach of the Sugar Manufacturers' Research Department, for them to institute research departments modelled on the lines of that Department. The strength of the organization lies in the inter-disciplinary approach and in the close contact between research worker and consumer through the advisory committee of producers to the research department, and in the use of producers' fields for experimental work, which facilitates both the identification of problems for research and the rapid transmission of findings in a usable form. It should be possible for the Ministry of Agriculture and Lands to organize

its activities in such a way that an appropriate relationship can be established between its research staff and the farming community, even though the extension staff would generally have to act as intermediaries, carrying farmers' problems to the research agronomists and the findings of research back to the farmers. But if the conditions which define profitable research cannot be satisfied by the Government, then the case for increased expenditure on research is so much the weaker from a narrow economic point of view. Certainly it seems unlikely that Government can transmit findings on, say, yam research to the thousands of yam growers, as effectively as can the Sugar Research Department transmit its findings to the management of the twenty sugar estates which it serves. Against this, there may be potential benefits in terms of "social returns", which would justify a greater expenditure on research by Government than would be justified by reference only to "private returns".

Lines of Research

On what basis should lines of research be selected? That is, what products should be the subject of study and what features affecting their production should be investigated? At first sight the problem appears to be most daunting, because the choice has to be made from so many possibilities. But it would seem that if one abandoned the apparently *ad hoc* basis hitherto employed, one could develop an approach based on the simple proposition that the research undertaken should be such that with a given set of resources it will probably yield higher returns than available alternative combinations of projects. Principles relevant to the formulation of rules may be summarized as follows:

(1) Since research takes time to complete, it should be planned with an eye to the future.

(2) For a given volume of research effort there is probably an optimum number of projects: too few projects, that is below the optimum number, will result in lower total returns for the investment of effort than will the optimum number of projects, while too many projects will involve spreading the effort too thin to maximize total returns.

(3) Some products are, or are likely to be, very much more important to the economy than are others and should—other things being equal—be given priority in research.

(4) Although many products are each produced under a wide range of natural conditions, the greatest part of the production of each product is produced under relatively narrow range of natural conditions. The model ranges should be investigated before the relatively unimportant extremes.

(5) The results of some experiments are far more likely to be employed than are the results of other experiments.

Some of these principles (1, 2 and 5) require explanation:

(1) An appreciable period of time is commonly required in order to complete a series of experiments because:

(a) stable biological cycles are involved which cannot be speeded up,

(b) natural variation requires several cycles to be explored, each usually taking several years, so that the variation may be taken into account; and

(c) certain important effects are cumulative and do not emerge as important effects until more than one cycle has been completed.

An example of the third kind is provided by the infestation of rice fields by weeds when virgin land is brought into cultivation. Thus in Surinam, "After some three years, enormous infestation of the fields by weeds (mainly grasses) occurred, which led to yield depression."[74] A more general case is provided by "permanent" (tree) crops – which are of considerable importance in Jamaican agriculture – for which an extreme example is quoted. Commenting on the neglect of research on coconuts, one of the reasons given was:

> ...the crop is slow growing, generally taking four to five years to come into full bearing, and sometimes a good deal more, and many of its diseases do not affect the palms until they are mature. The crop, therefore, does not lend itself to research, especially pathological research. Symptoms develop slowly...the causes of the epidemic diseases of coconuts have remained mysterious since they were first recognised–in the case of 'unknown disease' a hundred years ago and root disease, seventy. These puzzles cannot be solved by *ad hoc* investigations over a period of two or three years...A very long term and carefully considered research programme is required...It is essential to ensure continuity over what must necessarily be a prolonged investigation...[75]

Many years, too, are required to produce a new breed of cattle. The danger here is of formulating a programme of breeding which can only be revised at great cost, in response to changed conditions calling for a different kind of animal. If the programme is too rigid, it will produce a kind of animal appropriate to a period many years before, but quite inappropriate to the period when animals of the new breed become available for distribution.[76] Clearly the need for flexibility in the breeding programme should be given due weight in devising the programme.

(2) The principle about the optimum number of research projects for a

74Dirven, J. G. P. and Poerink, H. J. *Weeds in Rice and their Control in Surinam.* Tropical Agriculture, Trinidad April, 1955, Vol. 32, No. 2, p. 116. It is interesting to speculate whether or not the Jamaican rice industry which began a great expansion in 1953 could have been expected to learn from this unfortunate experience of 1953, and so have saved itself from the serious problem of weed infestation which emerged in Jamaica, under similar conditions in 1955-56. See Agricultural Development Corporation *Fourth Annual Report and Statement of Accounts* for Year ended 31st March, 1956. Jamaica, The Gleaner Co. Ltd., (undated).

75Martyn, E. B. "Diseases of Coconuts" *Tropical Agriculture,* Trinidad, July 1955, Vol. 32, No. 3, p. 167.

76Jamaica seems to have been fortunate in producing a breed of cattle which will be suitable for emerging conditions, although its characteristics would not have been appropriate for conditions which have long prevailed and for which the breed was apparently intended. For a discussion of Jamaican experience of cattle breeding see Allen's articles in *The Daily Gleaner, (The Farmer's Weekly),* February 11 and 18. Jamaica, The Gleaner Co. Ltd., pp. 3 and 4.

given volume of resources available for research may be illustrated by asking what happens when the research effort available for the investigation of any one project varies. Consider the problem of determining the response of yield to various levels of fertilizer application under a given condition. If the research investment is very small it will not even be possible to determine the general shape of the response curve. If considerable resources are to be employed on the project, an unnecessarily large number of experiments will have to be conducted. But an intermediate volume of resources would have been sufficient to allow the shape of the response curve to be ascertained sufficiently accurately for the purposes of the consumers of the research findings. This is just another way of showing the effect of spreading given resources over too many projects so that each has insufficient; of having insufficient projects so that each project employs resources unnecessarily; and of an optimum number of projects thus ensuring an appropriate volume of resources for each project.[77]

(5) Three main contributions of research may be distinguished: to national policy; to the provision of improved inputs (for example, the development of a superior breed, possible only because of research); and, to the decision-making of the individual producer. The case of the individual producer illustrates the point about the employment of results of research. Various obstacles can prevent an innovation being employed by a farmer. Leaving aside such an important instance as his complete ignorance of the innovation, the obstacles include: prejudice by the farmer and, or other members of his family and community against the practice; reasonable anticipation that the introduction of the new method would not be profitable; refusal to accept a change which would involve the disruption of the present farm organization (rejection because the size of the investment necessary would be beyond the capacity of his management is a special case). Unless the decision to undertake research is preceded by realistic appraisal of the prospects of the findings of such research being used, it is likely that the investment in research involved will be unproductive.

The funds and the human and physical resources available for agricultural research will at any time be fairly fixed: thus the volume and quality of research effort must be taken as given for the purposes of devising a programme, so the opportunities for choice are those dealing with the kinds of research. Choice may be guided by the following rules, which follow from the principles enumerated earlier.

A. Efforts should at any one time be concentrated on a relatively small number of enterprises.

B. These enterprises should be chosen from amongst those that are likely

77This general problem has been treated in an important paper by Yates. See Yates, F. "Principles Governing the Amount of Experimentation in Developmental Work," *Nature*, London. July 26, 1952. Vol. 170.

to be important (and have good prospects) when the results become available.

C. The experiments should be directed at problems which are not only important but also hold promise of benefiting from the results of the experiment.

D. No attempt should be made to encompass the whole range of natural conditions under which an enterprise is conducted; rather work should be concentrated on the modal range, at least in the beginning.

E. Likely costs of experimental work as well as likely returns should be taken into account.

How would such rules be applied in practice? If an attempt was made to apply the rules immediately, there would be a special problem to face: whether to abandon or continue existing lines of work even though their initiation would not be justified by the application of the rules. Leaving aside this complication, the more persistent problems have to be faced. In essence they involve answering the question: What projects should actually be chosen? Probably the best starting point is to review the crops and livestock being produced and to assess probable or desirable trends for each. The distinction between probable and desirable trends may often be redundant since they coincide, but in certain cases the distinction may be important; some desirable trends might be frustrated by obstacles which could be removed if appropriate research were undertaken.

The review may well result in the identification of quite a large number of products which are likely to be or could, with advantage, be important in the future: but at least some and perhaps many products will be eliminated as relatively unimportant.[78] At this stage the persons responsible for research policy have to accept the fact that work on a few of the many important products is likely to be far more valuable than an attempt to work on all the important products. Once the products have been selected, it is probably desirable to identify the farming systems in which they are represented. An examination of the farming systems will allow the range of natural conditions under which a system is practised to be reviewed, and the greatest concentration of a system under a set of conditions to be identified.[79] The practices employed and the problems obtaining can be studied with a view to seeing what is important and amenable to change. This information about the farming systems will indicate the set of natural conditions under which a crop is grown which should receive priority in experimental work, and the practices which most deserve attention.

78The study now in progress at the University College of the West Indies involving long-term projections of the supply and demand for agricultural products in the West Indies would meet some of the needs of this stage of the programme formulation.

79If the plan for specialisation of product by area, as envisaged in the new Agricultural Development Programme, is implemented, the range of natural conditions under which a product is produced to an important extent will be narrowed and this will ease the selection of research projects in the future.

Such an approach would involve a careful study of the relevant farming systems using accumulated information and supplemented by further work where necessary. Attention would have to be paid to the farm people in relation to their farming system to determine what elements of the system seem tractable and what intractable to change in the future. This kind of investigation would call for skills not normally possessed by agronomists. In the cases where it is not possible to investigate the extent and direction in which a system is amenable to change, it is probably worth following the principle of undertaking research which results in applications involving lesser rather than greater changes in the farming system.

The view implicit in the work of many agronomists is that research should be directed at what they regard as a desirable state of farming, so that the prevailing pattern of farming must be changed, often radically, before the results of the experiments can be put into effect. The proposals outlined above do not accept this view because—in the absence of compulsion—the prevailing patterns have commonly proved remarkably resistant to efforts to change them. It seems more realistic to accept the systems as more or less given *until* their possibilities of change have been identified; then research to take advantage of these possibilities can be designed. This logic suggests a procedure of investigation which departs in many instances from the conventional approach of formal experiments on research stations.

Where current farm practice is very different from that which is regarded as desirable by the agronomists, and where there seems little prospect of farm practice being changed to the desirable form, there is a strong argument for carrying out trials on farms following formal experiments on research stations.[80] Much can also be learnt from the countless informal "experiments" undertaken by farmers in the course of their ordinary farming. It is easy while discounting the limitations of formal experiments to magnify the difficulties and weaknesses of carrying out simple trials on ordinary farms under the guidance of agronomists. But trials have been successfully carried out on a large number of farms, and these bear testimony to the value as well as to the practicability of the approach.[81] When work is conducted on farms, the investigation takes on something of the character of a survey rather than that of a formal experiment, and methods have to be chosen accordingly.

Preoccupation with the existing farming system not only encourages understanding of the logic underlying the system, but tends to lead to investigations of a more realistic character. Such trials are almost inevitably much more complicated than formal experiments and are likely to

[80] This would not generally apply to research directed at producing new material (e.g. breeds).

[81] For instance see the series of papers by Nye on his "Survey of the Value of Fertiliser to the Food-Farming Areas of the Gold Coast", *Empire Journal of Experimental Agriculture*. Vols. XXI and XXII, Nos. 83, 84, 85 and 86. July 1953, Oct. 1953, Jan. 1954, April 1954.

produce fewer clear-cut results. But this is not an unmixed disadvantage in applied research of this kind because the applicability of the results is also being tested. Thus, as in the corn example quoted above, it may become obvious that there is no scope for introducing isolated changes (such as fertilizer use) because the single change will not alone be profitable. Many changes would need to be made in concert; the changing of one practice alone would not help.

The process by which a research programme should be devised has, for the sake of simplicity of exposition, been presented as one in which each stage is settled before proceeding to the next. But in practise there would have to be a return (conceptually) from later to earlier stages. Thus a product which is considered as potentially more important than another, and on that ground is given preference for research, may involve so much less possibility of employing research findings than does the less important product, that the latter deserves to be given priority in the research programme. Another example of the possible need to revise a decision reached at an earlier stage by information encountered at a later stage is provided by the need to make allowance for the widely different lengths of time required to complete the various experiments. In short, likely returns from the various experiments should be discounted so that they may be reduced to a comparable basis, such as "present values".

Obviously the exercise of selecting projects to comprise the research programme is not one of simply comparing the probable costs and benefits, expressed in quantitative terms of each project. Even the direct money costs cannot be specified with certainty; while the opportunity costs and returns are virtually impossible to estimate at all closely. Recognition of the difficulties of making estimates of the costs and benefits should serve to draw attention to the complexity of the problem and to the need for the use of sound judgment. The approach outlined above identifies elements relevant to the problem: by making explicit these elements for consideration the chances of producing a sound programme should be improved. In the words of Carter and Williams

> Once the issues are stated clearly, a sensible judgment can usually be made, for what in the abstract may appear to be an impossibe choice between the imponderables is often easy to make once the possible lines of action are stated explicitly.[82]

The approach not only reduces the chance of omitting a valuable project from a research programme through ignorance or oversight while including an unimportant topic in the mistaken belief that it is important; it also provides a means by which the research programme can contribute to national policies. Research can be conducted on products which the country wishes to encourage. Further, the research projects could be chosen to foster a pattern of resource use consistent with national economic policy.

82Carter, C. F. and Williams, B. R., *Industry and Technical Progress: Factors Governing the speed of Application of Science*. London, Oxford University Press, 1957. p. 53.

For instance, in a country suffering from massive unemployment, experiments could be conducted on labour-intensive rather than labour-saving techniques. Conceptually this would be the equivalent of making the labour-saving technique carry a heavy social cost while crediting the labour-intensive technique with a large social return.

In short an attempt has been made to identify the main variables which determine the level of net returns accruing from an investment in research. The variables cannot all be quantified, but a general procedure has been suggested which can be modified to attain various ends.

The Application of Research Findings.[83]

It is obviously desirable that the findings of research should be transmitted to the consumers as soon as the results have been properly established and in terms which are both intelligible and useful. There seems to be no problem in the case of the sugar estates and their Research Department. The position of the cane farmers is different but, like the banana industry whose Research Department has not long been in existence, will be left aside in favour of a view of the more widespread problem of the transmission of information from research departments of the Ministry of Agriculture and Lands to the farming body. Some of the points to be made, however, have general application.

In 1950 a series of Research Bulletins was established "...to provide permanent and convenient records for workers in related fields here and overseas, now and in the future, but it is also hoped that they will enable the more progressive agriculturists to follow the work of the Department..."[84] The reports in the Bulletins are far from being complete accounts and discussions of the experiments. Unfortunately, too, the Bulletins are now running about four years late: the latest available (at the beginning of July 1961) relating to 1956-1957. It seems unlikely that many of the extension staff would be able to understand the technical reports of experiments contained in the Bulletins. Nor do there now seem to be – as there used to be – any permanent arrangements by which the results of research can be made available in understandable terms to the extension staff,[85] except through the Extension Circulars issued occasionally by the Ministry for the benefit of farmers.[86] The opportunity for co-operation

83For discussion of the limitations of existing experimental work in Australia and of what information is required by a farm management economist, see the paper by Alan G. Lloyd "Agricultural Experiments and their Economic Significance." *Review of Marketing and Agricultural Economics*, Vol. 26, No. 3. September 1958.

84Department of Agriculture, *Investigations 1948-1949* (Bulletin No. 45) (New Series) Jamaica, The Gleaner Co. Ltd., 1950, p. 7.

85See Kruijer, G. J. and Nuis, A *Report on an Evaluation of the Farm Development Scheme*. Jamaica, The Government Printer, 1960, p. 32.

86There is some danger that many extension officers do not read, and sometimes do not even see the Extension Circulars. This view is supported by personal observation and by a study made by Kruijer in one part of Jamaica. See, Kruijer, G. J. *Sociological Report on the Christiana Area*. Jamaica, Christiana Area Land Authority, 1956, p. 72.

provided by the transfer in 1951 of agricultural extension work from the Jamaica Agricultural Society to the organisation containing the research staff is not being well used. This being the case, it seems most unlikely that the Ministry's extension staff is as well informed as it should be of the findings of research undertaken by the various Commodity Research Departments.

When results become available from experiments (or trials) it is desirable that they throw as much light as possible on the problems investigated. The tendency of agronomists is to conceal the effects of natural variation and to present the results only in technical terms. But these tendencies are unfortunate. Far from concealing the effects of natural variations by averaging the results, the research worker should expose their frequency and extent so that he may indicate the probabilities of the occurrence of variations in natural causes. Thus crop failures due to natural causes can be turned to advantage: they may be seen as adding to knowledge, rather than spoiling an experiment. It is also desirable that the results should be translated into value terms so that their practical relevance becomes more apparent.[87] And most important of all, the extension officers should be trained to teach the farmers that the results give only general indications of the value of applying a particular practice. The individual's particular natural conditions, his peculiar managerial ability, and his other resources and goals must all be taken into account in considering the application of the practice in question. In the last resort, the individual farmer must test a new practice under his conditions and judge its value to him in the light of his circumstances. Results from (general) experiments cannot without modification provide unique solutions to an individual's problems.

In advising farmers, a course needs to be steered between neglecting to transmit well-established knowledge, thus losing the opportunity of using new lines of investment, and, on the other hand putting more weight on the available knowledge than it can bear, with the result that the persons acting on the knowledge will, on occasions, suffer disappointment and so develop a lack of confidence in the advisers who innocently mislead them.

Some Conclusions

Many of the conclusions which may be drawn from this paper have general relevance. But the conclusions contained in this section apply particularly to the Jamaican case.

Jamaica has a history of continuous scientific investigation into agriculture which spreads over more than 180 years. The work in the first century

87Only one of the many publications produced by the Department of Agriculture has revealed the economic consequences of an important practice. See Hewitt, C. W. *Profitable Production of Corn in Jamaica*. Extension Circular No. 53. Jamaica, Department of Agriculture, February 1954.

and a quarter of this period was concerned mainly with assessing the value of the numerous plants which had been introduced into Jamaica. Subsequently the research became more varied but the volume of work was small even as late as the 1940's. This decade proved a turning point for research in the island. It saw the establishment of a Research Department for the sugar industry and the expansion of research activities in the Department of Agriculture.

Near the end of the 1950's the volume of research effort (whether measured by value of expenditure or number of agronomists) directed to problems of the sugar cane and of bananas, was substantially greater than the average for all the other products. A similar conclusion emerges when the research effort is related to the value of output. It is, therefore, hardly surprising that the state of knowledge on the production of the sugar cane (under estate conditions) is reasonably adequate while the state of knowledge on most other products is far from adequate. (The volume of research on bananas has only been increased to the prevailing level quite recently.) Very little formal knowledge has been firmly established for many important products and fields, and even the cases where the degree of information is least inadequate do not closely rival the state of knowledge on sugar cane production.

A review of the natural conditions and of the relevant characteristics of the island's agriculture reveal the complexity of the subject matter for research. The natural conditions are remarkably varied for such a small area and the inconstant features vary greatly from year to year. Diverse products, often in several varieties, are produced by farmers of varied managerial ability employing a wide range of resources and of cultural practice.

Against this background how should the problem of increasing the supply of useful knowledge be tackled? Firstly, by making a greater use of research conducted in Jamaica and elsewhere. Secondly, by increasing the volume of research on Jamaican problems. And thirdly, by ensuring that the efforts are aimed in the most appropriate directions.

(1) There appears to be some scope for drawing on research conducted outside Jamaica to a greater extent than obtains at present. Naturally care must be taken to ensure that the results obtained from work outside Jamaica are properly tested to assess their applicabiiity to Jamaican conditions. Also the research conducted in Jamaica could be made much more valuable if complete technical reports were prepared for all experiments and (where appropriate) if the findings were translated into terms of their economic significance and disseminated widely in a form intelligible to the farming community. The results of previous research should be carefully reviewed to ensure that important findings are not lying unused in files.

(2) Jamaica is spending on agricultural research at a substantially higher rate than that occurring in Great Britain and America, although the rate

in these countries has been put forward as a rate to be aimed at, but unlikely to be achieved by less developed countries. There are reasons why a higher rate of expenditure on research in Jamaica than in Britain and America can be justified. These include, the relatively poor base of firmly established knowledge in Jamaica; the extremely varied agriculture; the varied and variable natural conditions; and the inevitably heavy incidence of research expenditure in relation to output when new research, which cannot be scaled-down below certain limits if useful results are to be attained, is conducted in an economy with a small total output. There is a strong case for effecting a considerable increase in the volume of agricultural research financed from Jamaican funds – as long as the research is well chosen and conducted and the results are employed. Using the island's sugar industry's practice as a standard, the increase of expenditure on research of other products would (depending on the basis chosen) lie within the limits of substantially in excess of £66,000 and of rather less than £428,000, say an increase of from one hundred thousand to four hundred thousand pounds on the present expenditure of about £324,000. In terms of research staff, the increase would be from 40 to 81 workers. Since the effective conduct and transmission of research in the sugar industry may not be matched in the other agricultural industries, the case for the use of more resources in research is the weaker, except in as far as the Government-financed part of the research can be credited with substantial social returns.

Partly as a result of the new research, it could be expected that output would be increased substantially and in this way the rate of expenditure on research in relation to output would, in the longer run, be lowered. But as long as there were good prospects for substantial increases in output, a policy of maintaining a high rate of expenditure on research would deserve serious consideration.

A significant part of the increased expenditure on research is likely to be borne by commodity associations, but by far the greater part will have to be borne by the Government.

(3) The third way of increasing the supply of useful knowledge is by ensuring that the research programme consists of the optimum combination of projects, given the Jamaican setting, the needs and the resources available for research. It is possible that the present programme of research of the Ministry of Agriculture and Lands – which has to face the most difficult problems of choice because of the extremely wide responsibilities of the Ministry – is optimal in the choice of projcts, but this seems unlikely. A procedure has been suggested which would allow a systematic comparison of important alternatives so that the existing programme could be tested, and, if necessary, a more satisfactory programme could be formulated. In this connection it is necessary to emphasize both the importance of basic (or pure) research in fields relevant to the agricultural industry,

without which applied research is often crippled,[88] and the importance of economic and sociological research applied to agriculture, which is valuable for the light it throws on the farm people and their economic problems.

Relatively little attention has been given in this paper to the administrative aspects of research in Jamaica. But considerable reorganization would be required to allow some of the recommendations implicit in these conclusions to be made effective. Thus the Ministry of Agriculture and Lands would have to administer its research staff in such a way that the procedure suggested above could be employed to formulate a coherent programme in contrast to the collection of projects now largely selected by individual research men. The work of the individual research officer would have to be more closely directed for the sake of the programme as a whole. With this closer direction it should become easier to arrange inter-disciplinary projects and to ensure that adequate consultation between the technical research officers and the statisticians and economists takes place at all stages of the work, from its inception to the translation of the results into useful terms. The special skills of the economists and statisticians could be enlisted, too, in formulating the whole programme and assisting in any research by survey, which might be undertaken.

A suitable programme is a necessary but not a sufficient condition for the production of adequate knowledge. Much depends on employing able research staff and on providing them with the encouragement to produce good work. Men whose performance in research is inadequate should be allowed to use their intimate knowledge of certain products in development work. Those who comprise the research staff should be provided with adequate facilities including sufficient competent assistants. They would also need to be given sufficient remuneration so that they will not easily be attracted to private employment. Morale could be raised, too, by encouraging the officers to offer papers based on their local research to learned journals with international reputations.

Some means must be found of taking greater advantage of the presence of both the extension and research staff within the same organisation. The research workers need to be adequately informed by the extension staff of the farmers' problems, and the extension staff must be acquainted with the findings of research so that they may transmit them to the farmers.

The proliferation of agricultural research departments and the increasing volume of research in Jamaica will call for a more formal kind of liaison than has hitherto been necessary. The Scientific Research Council seems admirably fitted to exercise this function through a standing committee on agricultural research. By maintaining a register of current agricultural

88A good example of the need for basic work is provided by banana breeding. See Osborne, R. E. *Breeding the Immune Banana: Occasional Bulletin No. 2*, Jamaica, Banana Board Research Department, 1958. pp. 1-2.
For a brief, general discussion of the importance of pure research for agriculture see Agricultural Research Council *The Agricultural Research Service*. London, H.M.S.O., 1953.

research in the island, and by arranging conferences to review existing and proposed programmes, unnecessary overlapping could be minimized, and important gaps could be identified. The existing research bodies could be encouraged to fill in the gaps. In this way key studies in pure research, which might be neglected by the individual (applied) research departments, could receive the attention they deserve, possibly by providing funds for their research to be undertaken at the University College of the West Indies in its Trinidad or Jamaican branches.

Whether Jamaica remains in the Federation of the West Indies or not, the existing co-operation for regional research in agriculture or some effective substitute, should continue so as to ensure that the benefits of co-operation are not lost. There is also a clear need for much more effective liaison with research organisations in non-British countries and especially in other tropical countries – both in the Caribbean area and elsewhere.

APPENDIX ON METHOD

REVIEW OF RESEARCH CONDUCTED ON CROPS BY THE MINISTRY OF AGRICULTURE AND LANDS

The register of research which was used as the source of information on crop experiments had the following characteristics:

(i) The inventory of experiments contains information only on research undertaken on crops and, in most cases, research in which statistical techniques of analysis have been used. Experiments on crops for which detailed results are not generally available, in the form of project sheets, are not included. This does not mean that the results of some of the other experiments would not be useful if they were available, although in certain cases the results are of doubtful value, either because the experimental design was unsound or because insufficient information has been recorded in the reports. (No written records are available for some experiments; the findings are present in the minds of persons connected with the experiments or have been transformed into improved varieties of plants or breeds of livestock, and into other forms.)

(ii) None of the crop experiments related to a period prior to 1938 and most of the experiments were initiated after 1944, many of them in the 1950's.

(iii) The experiments included had been completed (rather than abandoned) or were in progress by mid-1959.

(iv) Since details on the cards comprising the register were not always sufficient to determine the real purpose of the experiments, reference had to be made to the project sheets relating to certain of the experiments. Even so, there were a few cases where there was doubt whether an experiment should be classified as, for example, being

concerned with response to fertilizer rather than being a variety trial.

(v) Some of the "experiments" referred to were, in effect, no more than observations or slight trials and were of little consequence in relation to some of the substantial experiments recorded. Clearly then each of the experiments in the register cannot be counted as equal in value, just as the value of an experiment in the register cannot be equated with that of an experiment reported by one of the commodity research departments.

In consequence of these characteristics, information on livestock experiments had to be sought elsewhere, the crop experiments not included were ignored as irrelevant to the study since their results were not generally available for use, while the inclusion of observations and slight trials as "experiments" serve to overstate the volume of effective research.

Despite the difficulties enumerated, it would seem that the analysis of the register of crop experiments reported in the paper has provided a useful picture of the adequacy of experimental work conducted on crops by the Ministry. Further investigation of the records could be undertaken to make a more thorough assessment of the experimental work. Light could be thrown on the magnitude and importance of the various experiments so that nature of the programme could be determined more accurately. Investigation could also be made into the causes of discontinuing experiments, the extent to which the results of experiments are not written-up, the productivity of the various agronomists involved, and so on.

ESTIMATES OF MAGNITUDE OF THE RESEARCH EFFORT

EXPENDITURE (*recurrent*)

SUGAR CANE (1958 *CROP YEAR*)

Sugar Manufacturers' Association	(£'s)
Research Department	42,811
Contributions to outside research, etc.	27,822
[Veterinary Department i.e. Livestock Scheme ..	5,802]

Source: *Report of the Commission of Enquiry on the Sugar Industry of Jamaica*, January 1960. Jamaica, The Government Printer, 1960. p. 53.

BANANAS

Banana Board	Nine months ending 31-1-1959	Twelve months estimates to 3-4-1959
Research Department	24,734	32,978*
Banana Research Scheme	(Banana Board—10,000) Cameroon Development Board 5,000)	15,000
		47,978

* The nine months' estimates were increased by one-third to obtain the twelve months' figures.

Source: BANANA BOARD *Fifth Report of Banana Board for Nine Months to 3rd January*, 1959. Jamaica, United Printers Ltd. 1959. p. 8. Banana Board Research Department — Private communication.

Various Crops and Livestock

The preparation of estimates for research financed by the Ministry of Agriculture and Lands during the financial year 1959-60 was not an easy exercise because the published Estimates are arranged in a form which while satisfying rather narrow administrative purposes throw little light on wider issues. Various members of the administrative and technical (research) branches of the Ministry of Agriculture and Lands kindly provided guidance through the published statements of Estimates and of actual Expenditure and also supplemented them by statements of expenditure (relating to research stations, particular projects and Divisions), which were used within the Ministry.

The estimated ceiling expenditure on research by the Ministry of Agriculture and Lands for the financial year 1959-60 and for the Sugar Industry's Lifestock Scheme for the 1958 Crop Year (see above) was £223,300. This sum included generous provision towards the overhead costs of running the research stations, the emoluments, travelling and subsistence expenses of staff of the Ministry of Agriculture and Lands directly engaged in research on crops and livestock and a share of the costs of Divisions which, whether directly engaged in research themselves or not, serviced Divisions which undertook research. Since the individual items represent a generous estimate of the recurrent expenditure on research, the total can be accepted as overstating the actual expenditure.

Research Scientists

The Research staff of the Ministry of Agriculture and Lands had to undertake other duties in addition to research: the production of planting material and livestock of improved varieties had to be supervised, and other development and advisory work had to be done. Thus to compare the input of Ministry research staff with that of staff in private organisations who, apparently devoted most of their time to research, the input of Ministry staff has to be expressed as research worker-equivalents. The translation was done with the assistance of senior technical staff in the Ministry.

Sugar Cane (1958)

Number of investigational officers employed in the Sugar Manufacturers' Association's Research Department – 6.

Number of investigational officers employed by sugar estates – 8.

(Source: British West Indian Sugar Association 1958 *Handbook*. p. 60.)

Bananas (1957)

Number of research officers employed in the Banana Board Research Department (1-4-1957 to 31-12-1957) – 6.

Number of agronomists employed by the Ministry of Agriculture and Lands in research on bananas (31-12-1957)—1.

(Source: Banana Board Research Department *Annual Report* 1957-58. Jamaica, United Printers Ltd., 1959. p. 41.
City Printery Limited, *The Yearbook of Industry and Agriculture in Jamaica*, 1958. Jamaica, City Printery (undated). pp. 17-47.)

Other Crops (1957)

Number of research worker equivalents employed by the Ministry of Agriculture and Lands (31-12-1957)—11.

(Source: City Printery Ltd. (undated), pp. 47 and 48.)

Livestock (1957)

Number of research worker equivalents employed by Ministry of Agriculture and Lands (31-12-1957)—6.

Number of research workers employed by the Research Department of the Sugar Manufacturers' Association (1957)—2.

(Source: City Printery Ltd. (undated) pp. 47 and 48. The Sugar Manufacturers' Association of Jamaica *Annual Report of the Research Department*, 1957. Jamaica, (undated). p. 1.)

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Incalculability as a Feature of Sugar Production during the Eighteenth Century

By

Douglas Hall

West India sugar planters, during most of their history, have described three general categories into which they may be divided: those who, enjoying extremely favourable conditions of production, can make a small profit; those who can barely cover their costs of production and marketing; and those who, for a host of reasons, must perforce produce at a loss. Few have ever claimed a place in the first category. The clearest statement of these divisions was made in 1830 by the West India merchants in London who pointed out:

> That many estates have not paid the expenses of their cultivation for the past year, without charging interest on the capital, or even interest on the debts with which the estate may be encumbered, or anything for the support of the families dependent on them; and that a debt has actually been incurred by the proprietors, in consequence of the expenses exceeding the sale of the crop.
> That many other estates, more favourably circumstanced than the preceding class, by making better sugar, or by being cultivated at less cost, have not produced enough to pay the interest of the mortgages upon them.
> That the remainder of the estates, which are most favourably circumstanced, have yielded so little net income, that, upon the whole, great distress has fallen upon the families of proprietors, and upon all connected with or dependent on the West India Colonies.[1]

The main purpose of this paper is to show that however much they may have verbally deepened the shades of depression, the eighteenth century planters' groans were not always or entirely unreasonable. However excellent, well-equipped, and well-managed their estates might be, they could scarcely avoid a fundamental problem that although they were involved in a large-scale, capitalistic form of productive enterprise, they could indulge in little rational capital accounting. Consequently, they lacked the basic permissives of calculability of success or failure in their business. They seldom had any realistic idea of how the enterprise stood financially, or what its prospects were.

The method employed in this paper will be to take a few available late eighteenth century accounts of a sugar estate in the island of Grenada, to use these illustratively of the general state of affairs in British West India sugar production of the time, and to base the whole discussion on those "Conditions of Maximum Formal Rationality of Capital Accounting" laid

[1] *Statements, calculations, and explanations submitted to the Board of Trade relating to the Commercial, Financial, and Political state of the B.W.I. Colonies, 1830-31.* Compiled by Thomas Lack. Printed by Order of the House of Commons, 1831.

down by Max Weber.[2] Clearly, it will not be sufficient merely to show a divergence from Weber's conditions which represent an ideal state of affairs. The attempt will be, rather, to discuss the West Indies in terms of Weber, Weber in terms of the West Indies, and to indicate significant rather than small divergencies and incompatibilities.

Westerhall Estate in the island of Grenada belonged, in the early 1790's, to Sir James Johnstone who lived in England and employed Mr. Robert Keith, an Englishman, as his resident manager in Grenada.[3] Sir James had inherited Westerhall from his brother Lt. Col. Alexander Johnstone, and although the property had come to him encumbered with a debt of nearly 400,000 guilders

WESTERHALL ESTATE INVENTORY AND VALUATION, 1770
(Grenada currency)*

(A).	*Land and Crops*		
	732 acres cultivable land, valued at	£ 48,880	
	250 acres indifferent land, valued at	£ 5,000	
	982 acres, of which		
	332 acres of canes valued at	£ 5,976	
	77 acres of provisions valued at	£ 1,386	
	101 acres of pasture valued at	£ 1,212	
	"Hedges, gates, yard"	£ 75	
	Lands, etc.	£ 62,529	Grenada currency (or £ 39,080 sterling)
(B).	*Buildings and Equipment.*		
	Water mill house, 37'x32', masonwork and hardwood, valued at	£ 1,800	
	Cattle mill house, 60' diameter, new masonwork	£ 1,300	
	Boiling house, 87' long, 3 furnaces	£ 1,000	
	Curing house, 160'x28', for clayed and muscovado sugars, with cistern	£ 1,500	
	Still house, 63'x24', and equipment	£ 500	
	Dwelling house and kitchen	£ **	
	Manager's house, kitchen, and small store	£ 150	
	Bagasse houses (four)	£ 200	
	Hospital and Yaws house	£ **	
	Storehouse, 47'x18' (galleried)	£ 200	
	Mule pen, 108'x20'	£ 120	
	Sheep, cattle, hog pens	£ 50	
	Stoves (two)	£ 400	
	Agricultural and manufacturing utensils	£ 2,404	
	Smith's house, furnace, tools	£ **	
	Canal of 1,000 feet, and masonry reservoir	£ 512	
	Buildings, etc.	£ 11,786	Grenada currency (or £ 7,365 sterling)

*The rate of exchange at the time was approximately £8 Grenada currency for £5 sterling.

**The valuations of these items, unfortunately, are not to hand but they are not important to the argument and the given total includes them.

[2]Max Weber, *The Theory of Social and Economic Organization*. Translated by A. R. Henderson and Talcott Parsons; revised, edited and introduced by Talcott Parsons. (Hodge & Co., London, 1947), p. 252. The purpose here is simply to show that B.W.I. sugar production of the time lacked rational accountability. Whether Weber would consequently not have admitted it to be an example of industrial capitalism is another matter.

[3]All references to Westerhall are based on MSS. West India Documents at the University of Bristol. The call numbers of the documents used are: 41/21/1-2, 41/32, 41/59/6, 41/59/12, 41/59/13, 41/59/16, 41/60/2, 41/60/4, 41/61/1, 41/61/17, 41/62/2, 41/65/3, 41/70/9-11, 41/70/14, and 41/70/39-40.

(about £33,300 sterling), it was undoubtedly a worthwhile inheritance. This is borne out by a detailed inventory and evaluation of the estate made in 1770, and by subsequent references to it in the 1790's. But, as the records also show, Westerhall eventually fell into the hands of creditors.

INVENTORY AND VALUATION, 1770 (continued)

(C). *Slaves and Stock*

263 slaves, as follows:		
3 Drivers, 2 at £200 & 1 at £150	£	550
82 Fieldmen at £85	£	6,970
62 Fieldwomen at £75	£	4,650
5 Coopers, 3 at £150 & 2 at £100	£	650
3 Carpenters at £150	£	450
2 Boilers at £150	£	300
8 Servants at £80	£	640
20 Field boys at £55	£	1,100
15 Field girls at £50	£	750
31 Children at £30	£	930
16 Old and infirm at £10	£	160
6 Cattlekeepers and sicknurses	£	380
10 New Negroes at £37 (sterling)	£	592
30 Cattle at £10	£	300
51 Mules at £40	£	2,040
4 Horses at £20	£	80
Slaves, etc.	£	20,542 Grenada currency (or £12,840 sterling)

(D). *Summary*

Land and Crops	£	39,080 sterling
Buildings and Equipment	£	7,365 "
Slaves and Stock	£	12,840 "
Total	£	59,285 sterling[4]

In comparison with other British West Indian estates of the time Westerhall in 1770 was well-equipped, possessing all the essential facilities and machinery for the production of a large annual crop of cane and of sugar.[5] In 1793 it was apparently the same. In that year Keith wrote to his employer saying that he had purchased ten "fine stout young men and women", and five English mules "fit for draught". These had been paid for by "bills at twelve months sight" on London. He expected the harvest, about to commence, to yield 380 hogsheads or 650,000 lbs. of sugar and a good quantity of rum, but, he added, rum was hard to dispose of locally, there being only

[4]Bryan Edwards' account, in the 1790's of the capital necessary to establish a sugar estate in Jamaica provides a useful comparison. Edwards recommended for an estate to produce annually 200 hogsheads of sugar of 16 cwt. each:
Land: 600 acres, of which 300 would be planted in cane, 100 in provisions, 100 in guinea grass, and 100 left in its natural woodland state .. .. £10,071, sterling.
Buildings: a list very closely akin to that of the Westerhall inventory of 1770, £5,000, sterling.
Stock: 250 Negroes, 80 Steers, and 60 Mules .. .. £14,557, sterling.
Such an investment, Edwards contended, would yield an annual "£2,150 sterling, and no more, clear profit to the planter, being seven per cent on his capital, and £50 over, without charging, however, a shilling for making good the decrease of the negroes, or for the wear and tear of the buildings, or making any allowance for dead capital, and supposing too, that the proprietor resides on the spot . . . " Edwards, however, was illustrating that sugar was less profitable than supposed. See his *History, Civil and Commercial, of the British West Indies*, 5 Vols. (5th edition, London, 1819), Vol. 2, Book 5, Chapter 3.

[5]This was also borne out by the testimony of William Dickson of Barbados who knew Sir James Johnstone. See Wm Dickson, *Mitigation of Slavery*, London 1814, p. 294.

a nominal offer of 4½d. (currency) per gallon. In fact, the sugar actually shipped to Britain in that year exceeded Keith's estimate by 16 hogsheads. By eighteenth century reckoning this would have been an excellent return, and it will be seen that Westerhall was, in the late 1790's, despite many losses and encumbrances, still worth the cost of proprietory litigation.

During the processes of cane cultivation and sugar manufacture, and before the sugar was shipped, certain expenses had to be met. Salaries became due to the free supervisory and skilled estate employees, taxes to the local governments, payments to visiting sea-captains who brought slaves and various supplies of lumber, livestock and food to the sugar colonies, and payments to local merchants and other local creditors. Against these expenses the estate balanced its own local earnings from rent of land or of slave-labour, from sale of secondary estate produce such as grass or firewood or livestock, and from the sale of molasses, rum, or sugar. Indeed, in most islands the scarce currency served largely as a standard of value while sugar and rum and other produce were used as means of payment. But British commercial regulations, the British merchant-houses, and the absentee proprietors of West India estates did not favour the local disposal by estate managers of exportable produce and particularly of sugar. The merchants and proprietors also disliked too many large "bills on London" which would eventually have to be met out of the proceeds of sales in Britain.

Once the sugar was on board ship in the West Indies the British merchant-house to which it was consigned took over the detailed accounting. From the proceeds of sales they deducted the costs of shipping and marketing, including their various commissions, payments of interest and principal on sums advaced by them or others to the estate, and all other charges with which the estate was annually burdened. The balance was then declared and paid or kept on account.

Consequently, unless absentee-owners or merchants supplied the necessary information, estate accounts kept by resident managers were restricted to local dealings followed by a statement of the produce shipped. In 1793, for instance, we know that Keith purchased ten slaves and five English mules for Westerhall, and that his own accounts could be roughly summarized as follows:

EXPENSES

(Grenada currency)

(1) Miscellaneous expenditures on stores, equipment, labour, island taxes, salaries, 10 slaves, mules, coal, debts, etc.	£11,830
(2) Purchase of food provisions	£ 1,695
(3) Purchase of lumber	£ 785
	£14,310

RECEIPTS

(1) Sales of rum	£ 6,915
(2) Rent of land to Keith, and sales of sugar	£ 210
(3) Shipped to England 396 hogsheads of sugar (692,250 lbs) ..	£ ?
	£ 7,125
	+ ? Currency

Messrs. J. Petrie, Campbell and Company, the merchant-house to which most Westerhall sugar was consigned and where the estate's accounts were kept, would thus have either added the local deficit of £7,185, Grenada currency (just under £4,500 sterling) to the charges against the 1793 crop, or informed Keith to carry part of the deficit locally and reduce it in the following year. Note that among Keith's expenditures in 1793 is an item "debts", which might refer to just such a carry-over from 1792.

In 1794 Keith wrote to England telling of a scarcity and dearness in the island, of lumber.[6] Rum, he claimed, was still fetching only a nominal price, but it is hard to reconcile this with his accounted earnings from this source. He was unable to obtain the necessary quantity of staves for making hogsheads even though he was offering immediate delivery of rum in payment, and "this . . . will oblige me to draw further this year on the sugars than I expected." There had been other sources of much heavier expenditure. A new boiling house and curing house had been built that year. They were expensive, but "there are not two better buidings in Grenada".

On September 1st., 1794, Sir James Johnstone died and Keith returned to England, presumably to render his account in person to his new employer. By the terms of his will, Sir James left Westerhall in the hands of four appointed trustees, one of whom was Sir William Pulteney[7] who had previously taken over 300,000 guilders of the 400,000 borrowed by Lt. Col. Alexander Johnstone from Jean Osy of Rotterdam years before. The remaining 100,000 guilders were still not completely paid off, so when he died Sir James left at least two large creditors, Osy and Pulteney. The trustees of Westerhall, as from September 1794, were instructed to raise certain legacies and annuities mentioned in Sir James' will, to support the widowed Lady Johnstone for the remainder of her life, and to allow whatever remained from the annual proceeds of the estate to be passed over to Sir William Pulteney, who presumably undertook to see to the liquidation of the remaining debt to Osy.

But within months disaster had struck the estate. During a rebellion led by Julian Fédon,[8] Westerhall, like many other Grenada properties, suffered. The rebels were in control of the island from March, 1795, until June, 1796, when, on the re-assertion of British authority, many of the rebels, including slaves who had joined Fédon, were deported.

Immediately, John Ross, the newly arrived manager of Westerhall, set about the task of rebuilding the property. One of the mill-houses had been badly damaged, and there had been damage to other buildings, cattle, and crops. The slaves were put to work planting cane to be reaped in 1797. In 1796 the estate produced no sugar and its small earnings came from slave-labour hired out, when it could be spared, to government and other employers.

[6] As a consequence of limitations on trade with the United States of America.

[7] A brother of Sir James Johnstone, according to William Dickson, but a creditor none the less.

[8] In sympathy with French revolutionary movements in other islands of French control or previous French control.

In England, in the meantime, the trustees sought to borrow more money to finance the restoration of Westerhall. By a special Act of Parliament (36 Geo. III) they were allowed to raise by mortgage on the estate a sum not exceeding £10,000 sterling, to be used to repair the damages resulting from the insurrection. The other terms were no less precise. The estate was to be vested in three trustees of whom Sir William Pulteney was to be one. During the lifetime of Lady Johnstone, the trustees would receive all income from the estate and meet its various annual liabilities in the following order of priority:

(1) Costs of production (but not of re-habilitation which was to be financed out of the approved loan).
(2) Payment of interest and principal to Jean Osy, some of whose 100,000 guilders were still outstanding.
(3) Payment of interest on the new loan of £10,000 which had been advanced by Messrs. J. Petrie, Campbell and Company.
(4) Payment of a clear £500 a year to Lady Johnstone as from 1797.
(5) Payments of interest and principal to Sir William Pulteney.
(6) Payment to the trustees of £750 which they had advanced to Lady Johnstone, presumably during 1795-6 when Westerhall yielded nothing.
(7) Payments of the principal of the new loan.

When these commitments had been met, any remaining income was to go to Lady Johnstone; but there was a stringent proviso that defaults in any year, in respect of any of the liabilities listed, must be made good in the following year before any residual income could be declared.

In April, 1797, Lady Johnstone died and there began a legal dispute whether her heirs were entitled to receive such residual income as might annually be declared. Westerhall's income, despite the charges laid upon it, still seemed worth arguing for. Many a lesser estate would have folded under the burden. Statements of account from John Ross and from J. Petrie, Campbell illustrate the costs of marketing West India sugar in time of war, the inflated customs duties on colonial produce entering Britain, and the financial standing of Westerhall on December 31st, 1797.

Local accounts in 1797, according to Ross, were as follows: the estate's expenditures in Grenada on staves, casks, lumber, wages, provisions, and other smaller miscellaneous items, totalled £5,525 Grenada currency. Receipts, totalling about £4,100, were:

(1)	By pioneer and ranger hire (i.e. slaves)	£	257.	0. 0
(2)	By sale 1 puncheon oats and an old nutwheel	£	51.	11. 0
(3)	By sale 2 negroes to the 7th W.I. Regiment	£	272.	10. 0
(4)	By one negro kept with hire	£	275.	0. 0
(5)	By sale 6,567 gallons rum (57 puncheons)	£	2,995.	10. 3
(6)	By sale 2 puncheons rum	£	107.	14. 0
(7)	By sale 2,855 lbs. sugar	£	140.	9. 9
		£	4,099.	15. 0

"Of the sugar I sent to England", wrote Ross, "I can give no account, there

may be also some small sums paid by Messrs. Petrie and Company that should properly be charged to this account . . ."

Of the various statements issued by J. Petrie, Campbell and Company in 1797 we need only notice two. In one, they accounted for a shipment of Westerhall sugar received and sold by them in October:

Sugar received, 33 hogsheads containing 477 cwt. 1 qr. 1 lb.					
Charges:					
(1) Duty, at 17s. 6d. per cwt.	£417.	12.	0	sterling	
(2) Freight, at 6s. 6d.	£155.	2.	2		
(3) Insurance from fire	£ 1.	13.	0		
(4) Warehouse rent, at 3d per cask	£ 2.	17.	1	(*sic*)	
(5) Other miscellaneous charges	£ 15.	19.	6		
(6) Broker's commission, ½% on £1,820	£ 9.	2.	0		
(7) Merchant's commission 2½% on £1,820	£ 45.	10.	0		
	£647.	15.	9	sterling	
Proceeds: by sale of sugar received	£1,820.	0.	0		
Balance Credited to the Estate	£1,172.	4.	3	sterling	

Three points about this statement are worth emphasis. First, it deals with only one of several shipments of sugar from Westerhall in 1797. Secondly, it illustrates the high cost of getting sugar from the West Indies to the British market during the war period of the late eighteenth and early nineteenth centuries. Thirdly, it indicates one of the main sources of loss by wastage. Ross had shipped 33 hogsheads. At 15¼ cwt. per hogshead this should have been about 510 cwt. of sugar. But the merchants acknowledged receipt of only a little over 477 cwt. Until better methods of manufacture were introduced in the nineteenth century, West India planters suffered from the leakage of their poorly cured "muscovado" from the hogsheads on route across the Atlantic. Here we see indicated a loss of about 6½ per cent of shipped produce, a high but not unusual figure.[9]

During 1797 J. Petrie, Campbell and Company received other shipments from Westerhall. Their other statement which concerns us was made on December 31st when they declared a balance to the estate of £11,055.18.7. Now would begin the procession of whittling charges established in priority and beginning with the payment to Jean Osy. Not much would be left for the heirs of Lady Johnstone if they won their dispute; but clearly Westerhall was recovering its full swing of production. The total sugar output for the year must have been well over 300 hogsheads, a rapid recovery from the disabling blows of the rebellion, and a tribute to the managerial skill of John Ross.

Here the description rests, with but one more revealing comment. In December, 1805, there was published by Robert Wilkinson of 58 Cornhill, London, "A Topographical Description of the Island of Grenada". It contained the relevant information: "Westerhall Estate; area, 951 acres; produce, sugar;

[9]As late as 1845 this loss was estimated at 15 per cent of sugar shipped from Jamaica. See A. G. Fyfe, *Suggestions for separating the culture of Sugar from the Process of Manufacture; with a Plea for Establishing a Central Sugar Factory at Annotto Bay, Jamaica*, London, 1846.

proprietor, the heirs of Sir William Pulteney." Even in times of high prices many West India planters suffered disappointing net incomes from their estates after the burden of encumbrances was laid on them. In 1830, when prices were low, the merchants had cause to complain. They were the intermediary bearers of estate indebtedness. The costs of production and marketing (including their own not illiberal commissions) might be reducible, but interest on debts, and the fixed annuities to litigious dependents were not. These were among the mill-stones around the planters' necks which the various West India Encumbered Estate Acts of the later nineteenth century were intended to remove.

Indebtedness, of course, is a perfectly normal feature of business enterprise. The role of credit needs no stressing here. It is essential to the satisfactory functioning of any enterprise, however, that not only the amount of investment and the yield of profit, but also the amount, degree, and cost of any necessary indebtedness should be reasonably calculable in advance.[10] This property of "calculability" was strongly urged by Weber in his discussion of capitalist organization and capital accounting. The Westerhall documents indicate great difficulties in the way of any such previous calculation, and an examination of eighteenth century West India sugar production in the light of Weber's "Conditions of Maximum Formal Rationality of Capital Accounting" reveals a number of important points.

Weber's conditions can be summarized as follows: (1) the complete appropriation of all the non-human means of production by owners, and market freedom in disposal of the product; (2) complete autonomy in the selection of management by the owners; (3) no appropriation of jobs by workers or of workers by owners; (4) complete absence of substantive regulation of consumption, production, and prices, and of other regulations limiting freedom of contract; (5) the maximum calculability of the technical conditions of the productive process; (6) complete calculability of the functioning of law and government and a reliable guarantee of all contracts; (7) the most complete possible separation of the enterprise from the household or private budgetary interests; and (8) a rational monetary system. We shall discuss them in turn:

(1) The eighteenth century West India planter owned not only the non-human, but also most of the human means of production in his enterprise. The complication of slavery will be discussed later. But the planter did not have freedom in the marketing of his product because he was bound by still existing British mercantilist regulations and, at various times in the century, by war-time regulations and irregularities. It is not clear, however, why market freedom, or as Weber more fully described it "the complete absence of all formal appropriation of opportunities for profit in the market"[11], contributes to rational accounting. The securing of a market, whether by agree-

[10] By "satisfactory" I do not mean profitable (which many estates were, as the continuance of the sugar industry clearly indicates), but responsive to managerial scheme and control.

[11] Weber, p. 252.

ment with the buyer or by compulsion of the buyer, must tend to assure disposal of the product at a price agreed upon or compelled by the seller, and thus "calculable" in high degree. But this the West Indians did not have. They were secured to the British market by British regulations, but the market was not secured to them and there was no assurance by agreement, or otherwise, of the prices in that market. The possibility of any reasonably formed expectation of income or profit during a century of war-time fluctuations of markets and prices was consequently slight.

(2) Weber's second condition assumes a rigorous separation, in the mind of the owner, between business and personal interest. Complete autonomy in the selection of a manager allows the owner to appoint, say, his son to a managerial post. But whether he would do so because of a real confidence in his son's managerial skill, or for other reasons, is an important question from the point of view of the business. The eighteenth century West India planters generally enjoyed this autonomy in selection, but did not always exercise it free of personal interest. In this they were not unlike most of their contemporaries who still also had not clearly distinguished between business and personal or family affairs. They suffered a handicap, however, in comparison with the owners of business in larger, unenslaved societies; for in the West Indies the ranks from which estate managers could be chosen were small and in Britain were confined to those who were prepared to go to the tropics. Perhaps when the West Indies were thought profitable this was no great limitation, but the essential point is that autonomy in selection is itself unrelated to the principles guiding the choice.

(3) Here the distinction of the slave force from the free labour market is obvious, and Weber advanced several cogent arguments to support his proposition that full-fledged slavery, especially, is "less favourable to rationality and efficiency than the employment of free labour . . ."[12]. That the eighteenth century planters suffered these hindrances is indisputable, but there remains an aspect of slave labour which has not yet been sufficiently emphasized. "Slave labour" is an unfortunately misleading term (from the economic point of view). That estate slaves were a form of capital investment, is beyond argument. Their "labour" was, consequently, not "labour" in the sense in which we use it in respect of "free labourers", but rather "power" in the sense that it is used of the efforts of livestock or the work of machinery. The eighteenth century planters' inventories almost invariably classified slaves with "stock".

Slave labour was mainly unskilled; consequently what the planter had at his disposal was a fund of power, which could be applied to any of a multitude of purposes. Slaves, far more than machines or the other livestock, could serve a variety of industrial (and other) ends. They were multi-purpose equipment, and when emancipation and the planters' compensation came these represented a forced liquidation of the planters' most flexible

[12]Weber, p. 253.

capital equipment. That is why emancipation was accompanied by a large exodus of planters from the sugar industry. A time of forced liquidation of capital is a good time to close down operations if future prospects seem disheartening.

Emancipation, therefore, was of industrial consequence not because it replaced "slave labour" by "wage labour", but because it introduced "labour" as a significant feature of production and of accounting, because it compelled those remaining in production to place future investments in far less "flexible" capital equipment and machinery, and because it brought, for the first time in the West Indies, significance and real meaning to concepts such as "labour-cost", "labour-productivity", and "labour-saving".[13]

(4) West India sugar producers were limited by no substantive regulation of consumption, production, or prices, except in so far as British commercial and maritime controls directed their transactions to the British market and subjected them to British laws and taxes. During the late eighteenth and early nineteenth centuries, planters and merchants cried out against the high import duties levied for revenue purposes, in time of war, on colonial sugars entering Britain, and argued that as duties inflated prices to consumers so the market was restricted. But it cannot be said that the duties were imposed in order to limit the market. Indeed, they were imposed because, as a tax on a necessary article of diet, evasion by consumers' abstinence seemed less likely to occur. Whether the rates of duties levied were such as to afford the maximum yield of revenue is a nice mathematical question which need not be discussed here.[14]

Restriction to the British market did, of course, limit freedom of contract with foreign dealers, but as long as British West Indian sugars were faced with an increasing British demand and growing foreign competition this restriction and the protection which went with it gave security to an industry which, more and more, shouted its own inability to compete. The big question in the minds of the planters in the early nineteenth century was

[13]Reasonable objections to negligence in this discussion of the social and human aspects of slave production emphasize how complicated this matter is, and how inadequate have been the many pre- and post-emancipation attempts to account the comparative costs of free and slave labour.

[14]The following figures are illustrative of the growth of the market during a period of rapid population growth in Britain:

Year	Imports (to nearest 100 cwt.) of B.W.I. Raw Sugar into Britain	Import Duty per cwt.	Prices offered (per cwt.) in London, excluding duty.
1780	1,300,000	6s.7½d.	59s. and 45s.
1795	1,672,800	15s.	64s.7½d. " 54s.10d.
1800	2,312,500	20s.	59s.11¼d " 37s.5¼d.
1805	2,583,000	27s.	51s.2¾d. " 47s.9½d.
1810	2,964,700	29s.	53s.9¾d. " 44s.2¾d.
1815	3,381,800	30s.	64s.2¾d. " 57s.2¼d.
1830	3,682,900	24s.	34s.2¼d. " 25s.

Sources: Edwards, *op. cit.* Vol. 5, and L. J. Ragatz, *Statistics for the Study of British Caribbean Economic History*, 1763 - 1833 (London, 1927).

Note: Prices 1780 are the highest and lowest offered that year. Other prices are the highest and lowest average monthly prices offered.

how much longer they would enjoy the protection offered by the mercantilist policies of which this restriction was a fundamental ingredient.

Within the industry and the British market, however, certain obstacles to freedom of contract between producers and merchants did arise. These were a consequence of planters' commitments, by family agreement, by custom, or, most important in this context, by indebtedness, to particular merchant-houses. The connection between Westerhall and J. Petrie, Campbell and Company is a case in point. Westerhall sugar was sold in the market that Petrie, Campbell and Company chose for it and at prices they accepted. Westerhall needs were obtained through the agency of Petrie, Campbell, whose interests were not necessarily those of the estate. Westerhall's indebtedness, moreover, gave to the firm a lien on the estate's produce. The freedom of the proprietor to search out the means of increasing receipts by selling produce to the highest bidders, and decreasing expenditures by careful purchases of needs, was thus limited by the commitment to a particular intermediary whose interests were not necessarily compatible with his own, and over whose actions he had little control as long as he remained a debtor.

(5) The incalculability of the technical conditions of sugar production in the eighteenth century scarcely needs further emphasis. Slave labour, as Weber pointed out, was unwilling, uncertain, impossible to cost in any meaningful manner, and subject to social, political, and biological influences which the slave owner had to take account of but could not account for. But even within the manufacturing process itself uncertainty prevailed as a consequence of inefficient techniques. The quantity of sugar shipped was not the same as that received by the merchants. There was always a loss, of unpredictable extent, on route, depending on the quality of the sugar, the state of its containers, the time-length of the voyage, the manner of ship storage, and the time lapse between arrival in a British port and release to a purchaser. Of this, and also of the prevailing uncertainty of the public administration and law, the Westerhall documents offer clear illustrations.

(6) One need only remember the numerous naval and military assaults in the Caribbean in the eighteenth century to realize how incalculable were the continued functioning of the public administration and the legal order, and how unsafe was any formal support by governments of terms of contracts. Between 1759 and 1814, only Barbados, Antigua, and Jamaica, of the British sugar colonies in the Caribbean, remained uninterruptedly in British ownership. St. Kitts and Nevis changed hands twice, St. Lucia nine times, and Grenada five times. Apart from these external disruptions of the local administrations, moreover, there were local uncertainties arising out of fears of foreign invasion, long internal strife such as between the Maroons and the colonists in Jamaica, or shorter but sometimes violent political disagreements, riots or slave rebellions.

(7) Weber's seventh condition required the most complete separation of

business and private family interests and accounts. Of this, something has already has been said, and again the Westerhall accounts are illustrative of a general pattern. By generous gifts bestowed in times of prosperity and optimism about the continuing profitability of sugar, many estate owners encumbered their properties with charges on expected profits. When the profits declined the beneficiaries, accustomed to and often dependent on their gratuities, pressed impossible claims upon reduced and insufficient means, and often enjoyed, as Lady Johnstone did, a prior right of satisfaction over the business needs of the estate.

(8) Finally, the eighteenth century sugar planters operated in a confusion of currencies and money exchanges. Spanish, American, British, and other coins were openly used. A variety of negotiable papers exchanged hands. And where and when coins and papers were scarce, money served as a standard of value by which commodities were exchanged one against the other. It will be remembered that Keith tried to purchase lumber with rum. Not until the middle nineteenth century did the foreign coins begin to disappear from circulation as British currency was more generally brought into use, and even today business can be done (though not always legally) in the marketplaces with £sterling, £Jamaican, $U.S.A., $Canadian, $B.W.I., and, in some islands, with guilders and francs. In part, the present situation reflects an increasing sophistication in currency affairs, such as is demonstrated in "black market" dealings; in part also it reflects an historical familiarity with an irrational monetary system. The irrationality in the eighteenth century arose not simply out of the use of a variety of currencies, because in most cases the rates of exchange were fixed; the difficulty came rather from abrupt price fluctuations, and from variations in the volume of currencies in circulation which made currency of any kind difficult and often expensive to secure.

Uncertainty must in some measure attend all productive enterprise. Much has been written of the profits of sugar in the eighteenth century, but not enough has been said to emphasize the high degree of uncertainty and incalculability which faced every proprietor who might have sought to engage in any formal accounting of his investments and their probable yields. There can be little doubt that many of the financial encumbrances assumed by the planters were entered upon in moments of blind optimism. Current prices may have seemed to justify the optimism, incalculability provided the blindfold. Risk was ever present and always acknowledged by the eighteenth century European farmer-manufacturer in a tropical slave society. Where calculability is possible, risk can be reduced by insurance against disaster. But where even probabilities cannot be reasonably calculated, insurance, which is itself calculated on the basis of probability, cannot be bought, or must be priced high, and risk must remain unmitigated or too dearly avoided.

For the West India planter, unlike many other producers of his time, the amount of capital to be risked was considerable[15]; costs were swollen by

[15]As illustrated by the Westerhall inventory and valuation, and by Bryan Edwards' accounts.

high shipping and marketing charges; the prices of his products fluctuated violently with wars, hurricanes, and the state of the British home and re-export markets; and his major operations were carried out in the fretful environment of an unstable local government and a slave society. These conditions had much bearing on the planter's apparently sole concern to exploit while the opportunity allowed, and to shut his eyes to plans and preservation for the future. These last were beyond his limited range of calculation.

During the nineteenth century, the emancipation of the slaves, currency reform, corporation finance and limited liability, improving techniques of agriculture and manufacture, *laissez-faire* and the Pax Britannica, all helped to bring the conditions of production nearer to those observed by Weber. Later developments, on the other hand, have questioned the validity of certain of his conditions, and have modified others in the light of departure from the principle of untrammelled economic enterprise.

In the twentieth century, sugar producers, in common with producers of other agricultural staples, have sought to avoid the incalculability of unpredictable price fluctuations by negotiating for guaranteed markets, quotas, and firm prices, and by setting up "stabilization funds". In this, they have implied doubt of the validity of Weber's contention for "the complete absence of all formal appropriation of opportunities for profit in the market". Also, the growth of trade unionism and the formidable demonstrations of power, and not infrequently of irresponsibility, by trade unions, have certainly modified Weber's conditions of complete autonomy in the selection of management by the owners, no appropriation of jobs by the workers, and freedom of contract.

However this may be, it appears reasonable that in discussing the West India planters and their sugar industries of the eighteenth century we should emphasize, not only the inefficiencies supported by slave production and a highly protected market, but also the great deficiency of the possibilities of calculation and capital accounting.

A First Appraisal Of Monetary Management In Jamaica.

By

Lloyd Best and Alister McIntyre

As there has been very little academic discussion of the problems of monetary management in the West Indies, we have taken the occasion of the first policy operations by the Bank of Jamaica to initiate what we hope will be a critical examination of the possibilities in this field.

Our main aim is merely to point to some important questions rather than to explore them fully. Indeed, at this stage one can only indicate some of the more obvious lines of action, since certain basic research remains to be done and the authorities are yet to attempt a clarification of policy prospectives.

We hope, however, that the paper will generate a body of informed analysis which could provide a basis for the final monetary arrangements, now being worked out for the West Indies Federation as a whole.

We begin below with a brief consideration of the objectives of monetary policy in which we suggest what may very well be a rather controversial ordering of priorities.

I

If there was any justification for a Bank of Jamaica other than mere symbolism, it could only have been that some institution was needed to insulate the monetary system from undesirable forces operating upon it from outside. It follows from this that the Bank should have been endowed with techniques of control which could be used to defend the pursuit of domestic economic goals against the operation of external forces.

In respect of policy objectives we take it that top priority in Jamaica should be given to the fostering of economic growth, which so far as it involves monetary policy, requires the Authorities within the limits of their competence, to encourage the provision of maximum credit at minimum cost in support of productive investment. Other objectives such as the maintenance of the external value of the currency, the guarding of the external reserve position, and the stabilizing of the internal value of money must necessarily be subordinate, receiving attention only to the extent that they contribute to the achievement of the main goal.

We must make it clear at this point that this statement of objectives and priorities is our own. So far as the official position has been stated in the

Bank of Jamaica Law (Section V), the principal objectives of the Bank are defined as

> to issue and redeem notes and coins, to keep and administer the external reserves of Jamaica, to influence the volume and conditions of supply of credit so as to promote the fullest expansion of production, trade and employment, consistent with the maintenance of monetary stability in Jamaica and the external value of the currency, to foster the development of money and capital markets in Jamaica and to act as Banker to the Government.

One can point here to two levels of confusion. First of all in the Law itself there is failure to distinguish between primary and secondary goals. Objectives such as the issue and redemption of notes and coins, the administration of external reserves, the development of money and capital markets, and serving as Banker to the Government, are clearly of a different order from the other stated goals since they are merely means and not ends.

Secondly, in so far as there is any ranking of policy objectives at all, it seems to come into serious conflict with the declared aims of overall economic policy. The Bank is charged with (and we quote again for ease of reference) influencing "the volume and conditions of supply and credit so as to promote the fullest expansion of trade and employment *consistent with the maintenance of monetary stability in Jamaica and the external value of the currency.*" (our emphasis).

This makes it clear that the promotion of economic development has been subordinated to the defence of the internal and external value of the local currency. One wonders whether this implies that the Government has not reconciled the aims of monetary policy with those of general economic policy.

It may well be argued however, that too much emphasis should not be placed on formal declarations of policy and on institutional arrangements, and indeed it has been pointed out that "although good statutes are useful, everything really depends on good management".[1] It follows that the operations of the Bank of Jamaica need not be circumscribed by too strict an interpretation of the Bank of Jamaica Law. It is therefore of some interest to examine the measures which have recently been announced by the Bank of Jamaica in response to changes in the Bank of England discount rate, to see what they suggest about the performance of management and the limitations of the law.

In connection with these, there are three questions which we shall ask: First, what objectives did the Bank of Jamaica intend to achieve? Secondly, how effective will the proposed measures be in achieving the desired objectives? And thirdly, were there any alternative measures which promised greater effectiveness?

II

It has been reported in the press[2] that the Governor of the Bank declared that the rise in the local Bank rate and the changes in the commission rates

[1] J. B. Loynes, Adviser to the Bank of England, "Address to the Economics Club of Kenya," *East African Economic Review*, December, 1960.

[2] *The Daily Gleaner*, July 27th 1961, P. 1.

on the buying and selling of sterling were designed to discourage the outflow of funds to London. The clear intention behind these measures was to leave relative interest rates between Kingston and London unchanged, though they imply an absolute increase in local lending rates.

One must note at once that the external value of the currency has not been preserved, since the changes in the commission rates on foreign exchange transactions are equivalent to a slight devaluation of the Jamaican Pound. Further, since the cost of borrowing at home has been raised, the needs of trade and of sustained activity at home are served only to the extent that the availability of credit and not its cost is the limiting factor. It must be noted too, that if the increased cost of credit does not restrict activity at home, there is the possibility that the internal value of the currency (if not monetary stability) might not be maintained.[3]

Taking these points together, we can conclude that the measures taken by the Bank were not in full conformity with the order of priorities set out in the law, since the maintenance of the external value of the currency has been sacrificed (if only, to a small extent), and the internal value has been left in doubt. Instead, it appears that the Bank might have had one or both of the following motives in mind when it took steps to check an outward flow of funds: (1) the prevention of a disturbance in the capital account of the balance of payments for its own sake; (2) the retention of the supply of loanable funds available at home in support of the needs of trade and employment.

The first possibility need not be treated as a separate case since the Governor stated that the intention was to insulate the Jamaican monetary system from changes taking place in the United Kingdom, "dictated by economic circumstances there which did not necessarily apply to the Jamaican economy".[4] It follows from this that the prevention of disturbance in the balance of payments was not the sole concern of the authorities: even if it was desirable for its own sake, it must have been considered compatible with, and a necessary condition for, maximising the local supply of loanable funds.

III

We must now pass on to examine the second question — whether the action taken by the Bank can achieve the desired objectives.

For this purpose, we have to distinguish factors influencing the demand for loanable funds from those affecting the supply. By stressing, though covertly, supply factors, the Bank if it is interested in preserving the level of activity at home, is making either or both of the two following implicit assumptions

[3]Although rising interest rates may not deter borrowing, they may push up internal costs and prices, thus lowering the internal value of the currency. This need not be inconsistent with the maintenance of monetary stability, if this objective is defined in terms of some permissible rate of increase in prices (say 2 or 3% per annum). So far as we know, there has been no clear statement of what the authorities regard this term to mean.

[4]*The Daily Gleaner*, op. cit.

about the demand for funds: (1) that the interest elasticity of demand in respect of upward changes in interest rates is very low, perhaps zero or even negative; (2) that even if the interest elasticity of demand is positive the intensity of demand is increasing and would operate to offset its effect. Theoretically both possibilities are open and we would have further to disaggregate the elements of demand before we can decide whether in the current circumstances they are realistic.

We can point to two factors which influence in differing degrees, the interest elasticity of demand for funds. The first of these is the expectations of borrowers about future changes in interest rates. In the current context there is reason to believe that borrowers will regard an increase in local rates as temporary, expecting a reversal of the upward movement in the near future. For the present level of rates can be looked upon as being in "high gear", whether viewed in terms of current economic conditions at home or in relation to the "see-saw" behaviour of the British Bank rate over the recent past.[5]

If this interpretation is correct, one should expect a high rather than a low interest elasticity of demand for funds. Conversely, if borrowers expect that the upward trend in interest rates will be maintained in the future, there would be a tendency for the interest elasticity of demand to be zero or negative.

The second factor which may influence the interest elasticity of demand for funds is the ability of borrowers to pass on increased interest charges by way of higher prices, which in turn depends on price elasticities of demand facing individual sellers in product markets. However, the significance of higher interest charges is only great where interest represents a sizeable proportion of total costs.

Naturally we will expect to find that different sellers are faced by different price elasticities of demand. But it will be surprising if the cases where these are low are the same in which interest charges constitute a sizeable proportion of cost. For example, the demand for Jamaican (and West Indian) sugar is relatively inelastic owing to the quota arrangement made under the Commonwealth Sugar Agreement.[6] At the same time, however, interest charges represent only a tiny fraction of total costs. On the other hand, Housing may be an outstanding exception, since one suspects that here the existence of low elasticities coincides with important contributions to total costs on the part of interest.

On balance, the evidence seems to point to high rather than low elasticities,

[5]The 'see-saw' behaviour of the Bank Rate was discussed by the Radcliffe Committee in their examinaion of the relationship between short and long rates during the 1950's. The Report pointed out that up to 1957 changes in short rates had little effect on long rates because they were regarded by transactors as temporary (See Paras. 448, 496 and 497). It is interesting to observe that this relationship does not hold in Jamaica where long rates, such as the mortgage rate, tend to move automatically with changes in the lending rates of the commercial banks. Thus we need only consider here the effects of the 'see-saw' movement on the behaviour of borrowers.

[6]This must not be confused with cases where ***at any given price*** Jamaica may be able to sell more than her quota because of shortfalls in production in other West Indian or Commonwealth territories.

since the effects of current attitudes towards the future of interest rates are likely to outweigh those arising from the other influences to which we have pointed. However, this is merely an informed guess. Further research is clearly needed before more definite propositions can be advanced.

In regard to the factors which influence the intensity of demand, we shall draw attention to only one – expectations about the profitability of expenditure out of borrowed funds. These are in part dependent on the current and expected levels of demand for the goods and services provided by borrowers; and in this connection we might note that the present picture is somewhat unclear owing to the operation of forces in different directions. For one thing, there has been some talk in commercial and political circles of a "recession" or "slowing down" in economic activity, which is perhaps not unrelated to the end of the "boomlet" in consumer credit. Furthermore, the recent developments concerning Britain's participation in the Common Market have increased uncertainty about future export markets and prices. Against this, persistent international tension may sustain optimism about the future buoyancy of export markets for "strategic" products such as bauxite and sugar. In addition, a markedly higher level of public expenditure is planned for the current fiscal year while, substantial increases in foreign aid are anticipated over the next year or two.

It is clearly difficult to form too firm a judgment on this particular aspect of the question, and we can merely conclude that any presumption of upward shifts in demand is unwarranted. However, in the light of our entire discussion of elements on the demand side, it would be surprising if the increases in local lending rates were not to lead to a fall in the quantity of loanable funds demanded.

Once we allow for this possibility, the behaviour of the commercial banks (that is supply conditions) becomes critical. If we assume that the supply schedule of bank credit is given, then a fall in the quantity of funds demanded will lead to a situation of excess supply, and a new equilibrium can be achieved only by an export of surplus balances, or by an increased willingness on the part of the commercial banks to hold local assets as cover for their deposit liabilities. The second possibility can be satisfied either if the commercial banks hold local currency or Jamaican Treasury Bills. But one could easily dismiss the possibility of a choice of local currency since this implies that they will be willing to hold non-earning assets rather than earning assets.[7]

As far as the choice between the holding of local Treasury Bills and the exporting of funds to London is concerned, the greater variety of assets in the latter market will probably weigh in its favour. But even if the banks choose to demand local Treasury Bills in preference to exporting funds, (and the Authorities are willing to supply them), the net effect of the monetary changes will only have been to support an undesired diversion of resources from the private to the public sector – unless one was willing to argue that prior to

[7]Even if they were, this will also lead to a sub-optimal use of funds.

these changes there was a mal-distribution of financial resources between these two sectors.

We have now answered our second question by saying that there is no certainty that the action taken by the Bank of Jamaica will check the outflow of funds to foreign centres. In addition even if it were to do so, there is no guarantee that the domestic use of loanable funds will be optimised.

IV

Finally we must explore the alternative techniques of operation which were available to the Central Bank. It seems that the only alternative weapons available to the Bank of Jamaica were the raising of the local assets ratio, moral suasion or the combination of these two with higher interest rates.

Now an increase in the local assets ratio unaccompanied by an increase in local interest rates or by the use of moral suasion, will prevent an outflow of funds if the commercial banks do not reduce advances, and if they are the sole holders of idle balances in the system. So far as advances are concerned, the commercial banks will attempt to maximise profits by changing the distribution of their portfolios between local and foreign assets. Advances may then be reduced at home in order to release funds for export. In the other case, if the banks are not the sole holders of idle balances, an increase in the local assets ratio will not prevent an outflow of funds by other holders such as Hire Purchase Companies, Building Societies, Insurance Companies and Private Firms. It is evident then, that the effectiveness of increases in the local assets ratio is severely limited by the fact that non-banking financial intermediaries stand outside its sphere of operation, and by the ability of the commercial banks to shift the composition of their assets.

The second alternative was the use of moral suasion. It has been argued[8] that in Jamaica this could be a very effective weapon of control because of the small number of commercial banks. But this argument does not accord with the recent experience in highly developed money markets such as the United Kingdom where there is also a small number of commercial banks. In any event, assuming as we have done, that the commercial banks are profit-oriented and owe allegiance to an outside system, there is no warrant for presuming that they will respect "the nod from local headquarters" except under very special conditions.[9] Moreover, the very fact that other techniques of control have been used, suggests that the Authorities are fully aware that moral suasion alone cannot do the job.

Finally, we must consider the use of interest rates, the local assets ratio and moral suasion in combination (which in fact means the use of interest rates and the local asset ratio taken together, since we feel that given its existing powers, the Bank can place little reliance on moral suasion). Now

[8]See forthcoming Report by Professor Arthur Bloomfield on "Central Banking Arrangements for the West Indies Federation: Issues and Alternatives."

[9]For instance, if as we propose later, the Bank of Jamaica is given the power to impose exchange controls over all overseas payments, this may increase the potency of moral suasion.

the combined use of these two weapons will tend to encourage suppliers of loanable funds to deploy their resources at home. Commercial banks and other holders of idle balances will be induced to do so by higher lending rates, while the banks alone will have the additional incentive of the local assets ratio. However, as we have already shown the rise in the cost of borrowing may reduce the quantity of loanable funds demanded and thus create an effective surplus. Under these circumstances it is conceivable that even with a higher local assets ratio, the decline in advances and deposits of the commercial banks, and the existence of surplus balances in the hands of non-banking intermediaries may lead to an outflow of funds.

So far our analysis has shown up three weaknesses in the techniques of control with which the Bank has been formally endowed. First, the use of higher interest rates tends to disturb the equilibrium of the loans market and exercises downward pressure on the level of activity at home. Secondly, the freedom of capital movements between London and Jamaica permits the commercial banks to achieve an equilibrium of their own which is not necessarily coincident with overall equilibrium in the local money market. Thirdly, the existing monetary controls can be applied only to the commercial banks which leaves other growing and important financial institutions free from monetary management.

V

We wish now to consider certain changes in the Bank's operations which are required to meet the deficiences outlined above. To start with, it is clear that interest rates are unsuitable for purposes of insulation since they affect the level of activity at home; their use should therefore be confined to circumstances where the main objective of the Authorities is to promote changes in the level of activity. Secondly, it is evident that the power to impose controls over foreign payments must be placed at the disposal of the Bank. For we have shown that the ability of the commercial banks to shift funds out of the country limits the effectiveness of the remaining weapons. Owing to the radical nature of this proposal, we intend to digress at length to consider some of the arguments against equipping the Bank with such power.

One such argument is that this would involve the delegation of too much power to the Central Bank. This objection makes little sense, if the Bank is properly regarded as an agency of the Government, engaged in executing one sub-division of general economic policy. In any event, the Bank has been formally charged in the Law "to keep and administer the external reserves of Jamaica". This implies logically some control over movements in the foreign exchange reserves. Perhaps what is required at this stage is a clear statement that the external reserves of the country are defined to include the overseas balances held by the commercial banks.

The second argument relates also to administrative matters. It is held that exchange controls involve the making of complex regulations which may not be susceptible of rapid implementation. There may be some truth in this con-

tention. But one should note that exchange controls have been administered since the outbreak of the Second world war, albeit in the interest of sterling area arrangements. And it has hardly ever been suggested that the administrative difficulties alone justified abandonment of this commitment.

The third argument is that the imposition of direct controls may destroy the confidence of financial institutions and may even lead to a flight of some of them from the territory. Here we need only cite the evidence given to the Radcliffe Committee by representatives of some of the banks serving in the area. There,[10] it was made clear that the banks envisaged that they would have to deposit at least a part of their surplus balances held abroad with the local central bank. On one interpretation this could be taken to mean that the banks expect some future control over the flow of funds between the West Indies and London.[11]

A fourth objection may be that the unilateral use of exchange controls will not be in conformity with membership of the Sterling Area, since this implies restrictions on payments to countries within the area. India's experience casts some doubt on the strength of this argument, since she has applied controls on sterling transactions in the interest of internal development. In any case this raises the wider question as to whether sterling area ties must automatically be maintained without a critical re-appraisal of their advantages.[12]

Finally, we must deal with what is probably the most important objection to the use of exchange controls. And that is its alleged disincentive effect on foreign capital. This again raises broader questions relating to the whole strategy of development to which we cannot possibly do justice here. However, we shall point to a few of the main considerations.

To begin with, there is little empirical evidence to support the contention that foreign entrepreneurs are more interested in guarantees about the repatriation of capital and profits than in the availability of profit-making possibilities. One may well argue that so long as foreign investors are assured that action taken by the local authorities is designed to sustain the buoyancy of the economy, and to strengthen its ability to meet external commitments in the longer run, they may not be unduly deterred by the imposition of exchange restrictions in the current period.

Even if they were, there remains the possibility of granting specific exemptions in cases where strategic projects or sectors are involved. Among other things this would have the merit of forcing the government to undertake a searching examination of the amount and types of foreign investment which

[10]See Par. VI (ii), Memorandum of Evidence submitted by Canadian Members of the British Overseas Banks Association, Vol. II of Evidence. See also, question 4476 and 4477 in the Volume of Oral Evidence.

[11]The fact that the banks envisaged handing over only a part of their overseas balances to the Central Bank is not necessarily inconsistent with the proposition that they anticipate some central banking control over overseas balances. For under most exchange control systems commercial banks are allowed to hold small working balances abroad.

[12]We leave this task to another paper since we are not altogether happy with the treatment accorded to this question by other writers. For a recent attempt to treat the problem see article by "Analyst" in the *Bulletin* of the Oxford University Institute of Statistics, November 1959 pp. 357 to 371.

are required. In this context it is interesting to note the following statement by Professor Lewis:

"I wish to say very firmly that in my judgment, the West Indies can supply all the capital that is required if it is prepared to do so."[13]

Whatever the merits of this view, it is clear that the seriousness of this objection is lessened to the extent that the West Indies could mobilise more of their own capital for developmental purposes.

There is some evidence that they can do so in respect of short-term capital[14] which is usually provided through the banking system. For instance between the years 1953 and 1959 the liquid assets ratio of commercial banks operating in the West Indies Federation, never fell below 32 percent; in most years it was much above 40 percent.[15] When we consider that the Jamaican Authorities regard a minimum liquid assets ratio of 15 percent as adequate,[16] there is reason to believe that there is excess bank liquidity within the Federal area as a whole. This is not true for Jamaica taken alone since in 1959 for example, the liquid assets ratio of the commercial banks was as low as 13 percent. Yet this does not necessarily invalidate our point. Rather it reinforces the case for unified banking arrangements within the Federation — a matter which we shall examine elsewhere.

We may note in passing that the general presumption that the West Indies is a "surplus area" is lent support by the oral Evidence given by the Canadian Bank representatives to the Radcliffe Committee. We quote a relevant passage below —

> You say that there are funds surplus to the requirements of the Banks with branches in the Caribbean which remain on deposit in the London Offices. Does this mean that there are larger numbers of bank customers in the Caribbean in relation to the number of people wishing to borrow there, and that you have surpluses of funds arising?
> Yes, total deposits are much greater than loans in the Caribbean.
> It is not just a seasonal matter? Is this continuing?
> Deposits fluctuate seasonally but are much higher than advances all the year round.
> If you could find banking borrowers there, would you be glad to lend more in the Caribbean?
> Yes, with a view to proper liquidity, we should be very pleased to lend money in the Caribbean on sound transactions.[17]

To sum up, although, admittedly we have not examined all possible arguments, we have shown that a convincing case against the imposition of exchange control remains to be made. Meanwhile the positive advantages of such a step cannot be ignored.

The third and final possibility of change which we wish to consider is the

[13]See, W. A. Lewis, "Employment Policy in an Under-developed Area", *Social and Economic Studies*, Vol. 7, No. 3, Page 53.

[14]The distinction we are making here between short and long term capital is for convenience only, since it is obvious that in so far as there is greater mobilisation of short-term funds, more resources will be released for long-term purposes. Indeed in several cases short-term funds are used for meeting long-term requirements.

[15]See, Table X, West Indies Financial Statistics, No. 1 of 1960 prepared by the Federal Statistical Office.

[16]See Section 12 of the Banking Law 1960.

[17]Questions 4466 to 4468 in Volume of Oral Evidence.

question of bringing non-banking financial intermediaries within the scope of central banking controls.[18]

We have already suggested that the local assets ratio can become a much more effective instrument if it is extended to these institutions, and no doubt in different circumstances advantages may be also derived from the application of other controls such as, for example, variable reserve ratios.

Such a change is in line with thinking in monetary circles in several countries. For instance, the Governor of the South African Reserve Bank pointed out in his Memorandum to the Radcliffe Committee that these institutions can be "instrumental in chanelling too large a proportion of loanable funds into types of expenditure which, from the point of view of society as a whole, may not be judged to be the most desirable at that stage" and added that "if monetary policy is to be really effective in the future, then other financial institutions must somehow be brought within its orbit to a greater extent."[19]

The Radcliffe Committee appears to have been somewhat undecided on the point. For although in paragraph 394 of their report they expressed the view that such controls would involve unwelcome administrative burdens, in later sections[20] they recognised the need to extend controls which would normally apply to the banks to other institutions as well. We need hardly state that in the Jamaican context where the Hire Purchase Companies tend to encourage expenditure on consumption, especially on foreign-produced consumer durables, the South African position is rather more in point.

VI

In summary, the substance of the argument as developed in this paper is:

(1) If monetary policy in Jamaica is to be consistent with overall economic policy, the operations of the Bank of Jamaica must be designed principally to serve the needs of economic growth. (Part I);

(2) So far as there has been a statutory ranking of policy priorities for the Bank it appears that the objective of encouraging growth has been subordinated to those of maintaining the value of the Jamaican pound at home and abroad. (Part I);

(3) The first operations of the Bank have revealed a certain administrative re-ordering of these priorities since the measures taken involve: (a) a slight devaluation and (b) the possibility (however remote) of increased costs and prices at home and consequently, of a reduction in the internal value of money. (Part II).

(4) Given the alternatives open to the commercial banks, and realistic assumptions about demand conditions and about the interest elasticity

[18]This possibility has attracted considerable support in the literature on monetary management. See, particularly, J. G. Gurley and E. S. Shaw, "Financial Aspects of Economic Development", *American Economic Review*, September 1955 pp. 515 to 538.

[19]See paragraphs 48 to 52, *Memorandum* of Evidence Submitted by the Governor of the South African Reserve Bank, p. 290 of Vol. I of Memorandum of Evidence.

[20]See, paragraphs 504 and 509 of their report.

of borrowing, it appears that increased interest rates may not effectively prevent an outflow of funds as well as a mal-distribution of resources in the loans market. (Part III).

(5) Following from (4), changes in interest rates do not seem to be an adequate "instrument of insulation". Suitable alternatives need to be found. (Part IV).

(6) Given realistic assumptions about both supply and demand, and with the present restricted scope of the Central Bank's operations, the alternatives formally open to the Authorities promise no greater success than the measures which have been employed. (Part IV).

(7) Following from (4), (5) and (6) it may be necessary (a) to widen the controls available to the Bank by giving it the power to impose exchange controls and (b) to extend the sphere of the Bank's operations to cover non-banking financial intermediaries. (Part V).

One final point must be mentioned. In this paper, we have discussed monetary management in terms of the rather restricted approach to insulation adopted by the Authorities. They appear to conceive of the problem as one of adjusting to changes taking place in the metropolitan economy. We see it as one of making a break with the past by undertaking a total reorganisation of the local economy and of the institutions which service it. For monetary policy this probably requires, as a first step, a recognition of the fundamental disequilibrium which exists between present costs, prices and patterns of expenditure and the desired rate of growth. In order to correct this, a substantial devaluation must be considered as one of the most important possibilities. Such a consideration, however, is beyond the scope of this essay.

REVIEW ARTICLE

POLITICS OF THE DEVELOPING AREAS

by A. W. Singham

Two significant studies have appeared recently on the politics of the developing areas.[1] These studies are a welcome relief after the number of specific, descriptive and theoretical studies that have appeared.[2] Both Almond and associates and Emerson have attempted the difficult task of synthesizing a vast body of literature dealing with the developing areas, at the same time constructing "models" for political analysis. The theoretical orientation of the two studies indicates the variety of approaches utilized by political scientists. Almond, reflecting the mood of the "young turks" in political science, who are disappointed and disenchanted by traditional methods, introduces the political scientist to concepts and categories used by anthropologists and sociologists, while Emerson reflects the influence of history on political science and exposes the impetuous young functionalists to the value of studying institutional change in politics.

One of the by-products of the study of the developing areas has been that it has forced the social scientist to review the traditional methods of analysis and to accept newer and possibly more fruitful analytical tools. The most important consequence has been that the traditional division between theory and method has blurred, forcing the political scientist to develop a body of theoretical generalizations that are empirically based. Parsons' structure-functional theory, for example, provided the conceptual framework for a number of empirical studies in sociology. Almond and Coleman have attempted to develop a body of theory that could have a similar effect on political science. If this influence continues, we may begin to expect theoretically relevant studies in the near future.

While Almond and Coleman have raised the level of discussion it is equally refreshing to note that in these days of "group" research, Emerson has single-handedly attempted to synthesize data about the whole underdeveloped world and to present it in such a clear and precise manner.

While the approach of these two studies differs, the subject matter is similar. Almond and associates cover aproximately 75 countries, while Emerson is primarily concerned with those nations emerging from colonial status to independence in Asia and Africa. Both studies attempt to describe and

[1]Gabriel A. Almond and James S. Coleman, *The Politics of the Developing Areas*, Princeton, Princeton Universitv Press, 1960, and Rupert Emerson, *From Empire to Nation*, Harvard University Press, Cambridge, Massachusetts, 1960.

[2]For a select bibliography of recent items dealing with the theory of political development see the bibliography at the end of this review.

analyse political change. In that sense they are developmental studies, i.e., they attempt to *explain* change.

In spite of these similarities there are some fundamental differences. A layman reading these two books would be quite convinced that these gentlemen could not belong to the same fraternity of political scientists. For example in discussing political leadership, Almond and Coleman state:

> The political recruitment function takes up where the general political socialization function leaves off. It recruits members of the society out of particular subcultures — religious communities, statuses, classes, ethnic communities, and the like — inducts them into the specialized roles of the political system, trains them in the appropriate skills, provides them with political cognitive maps, values, expectations, and affects.[3]

Emerson on the other hand describes the same process in the following terms:

> In the colonial setting, the rising Westernized middle class elements have generally been able to take a clear political lead, while similar groups in the non-colonial countries have had to make their peace with the still powerful elements of the old regime. It is evident that no black-and-white opposition between the two situations can be established. In colonial areas the men who have come into the Western orbit are sometimes the sons of the families which made up the older elite, while in non-colonial countries the traditional leading groups embrace a constantly increasing number of men who have had experience abroad and have received their education in Western schools and universities.[4]

From the above, a naive reader would immediately conclude that Almond engages in unnecessary jargon, while Emerson emerges as a hero for his straight-forwardness and simplicity. It has become popular in some circles, especially in political science, to reject sociological and anthropological terminology by labelling it as jargon. The language of social science, because of its subject matter, has often been derived from everyday usages. But as the social sciences develop, a specific language with special meaning has emerged. Hence, Almond is not engaging, I believe, in conscious obscurantism when he describes the recruitment process in sociological terms. We have to examine his terminology, not in its aesthetic sense, but in its "contextual" sense. His terms and concepts have special meaning only if they are understood in terms of the whole system he is analyzing.

Let us turn then to this "model" he has developed, and examine whether the use of this model and its particular vocabulary were justified. Almond begins by recognizing the "culture-bound" character of western political analysis. The emergence of the new states of Asia and Africa with their indigenous cultures has meant that traditional political categories have to be broadened and in some cases replaced. He then proceeds to outline the major characteristics of a political system which can be utilized to analyze both western and non-western political systems. He is dissatisfied with Weber's classic definition of the state and attempts to modify it, borrowing extensively from Parsons and Levy. He characterizes the political system as

> that system of interactions to be found in all independent societies which performs the functions of integration and adaptation (both internally and vis-a-vis

[3]Almond and Coleman, p. 31.
[4]Emerson, p. 241.

> other societies) by means of the employment, or threat of employment, of more or less legitimate physical compulsion. The political system is the legitimate order-maintaining or transforming system in the society.[5]

The political system then is a net-work of political roles where the "actors" are oriented toward certain collective goals. Once Almond accepts the systems analysis it is not surprising to find him immediately introducing the term functionalism. For, as Alvin Gouldner has so succintly put it, "The intellectual fundament of functional theory in sociology is the concept of a 'system'. Functionalism is nothing if it not the analysis of social patterns as parts of larger systems of behaviour and belief. Ultimately, therefore, an understanding of functionalism in sociology requires an understanding of the resources of the concept of 'system'."[6] Gouldner warns, however, that "here, as in other embryo disciplines, the fundamental concepts are rich in ambiguity."[7]

It is this ambiguity that Almond tries desperately to avoid, by specifying the universal characteristics of political systems. He then identifies four of them:

(1) All political systems have political structures. (2) The same functions are performed by all systems. (3) All political structures are multi-functional. (4) All political systems are mixed, in that they are not all entirely modern or traditional.

He then looks at the functions performed by the political systems. Using Easton's input-output analysis, he introduces the following:

A. *Input functions*
   1. Political socialization and recruitment
   2. Interest articulation
   3. Interest aggregation
   4. Political communication

B. *Output functions*
   5. Rule-making
   6. Rule application
   7. Rule adjudication[8]

Thus Almond concludes that once we accept the concept of a political system, with its input and output functions, we will be in a position to meaningfully analyze all political systems.

It is unfortunate, however, that Almond has not taken seriously the "models" suggested by Sutton and Riggs. Sutton, for example, has brilliantly utilized the Parsonian pattern variables for comparative analysis. Almond is a little unfair when he suggests that the pattern variable concept has led to polarization. On the contrary, both Riggs and Sutton are quite cognisant

[5]Almond and Coleman, p. 7.

[6]Alvin W. Gouldner, "Reciprocity and Autonomy in Functional Theory", in Gross, *Symposium on Sociological Theory*, Row Peterson and Co., Evanston, Illinois, 1959, p. 241.

[7]Gouldner, p. 241.

[8]Almond and Coleman, p. 17.

of the fact that their models are merely two ideal types at the two ends of a continuum. In fact they are quite aware of the transitional nature of most societies. While we can agree with Almond that every industrial system has an agrarian system within it, it is most important that we distinguish between the agrarian system within, say, the U.S.A. and the agrarian system in India. While one can readily agree with Almond on the need for developmental models, one must be equally aware of the fact that for transitional societies it is quite difficult to develop models that do not become obsolete with time.

Having developed these analytical categories, Almond then gathers around him a number of area specialists, who proceed to collect data in their individual areas. The areas covered are South Asia, South East Asia, Latin America, the Middle East and Sub-Saharan Africa. In a sense this is the most disappointing part of the volume, for one would have expected these area specialists to take Almond's categories seriously, and especially to follow his methodological suggestion that "the functional theory of the polity which we have elaborated above does specify the elements of the polity in such form as may ultimately make possible *statistical* and perhaps *mathematical* formulation."[9] (Emphasis mine)

With the exception of Coleman's chapter on Sub-Saharan Africa the rest of the writers depend almost entirely on historical data. This part of the study reads like the traditional texts in political science. Instead of the expected rigorous and empirically based statements, loose and vague generalizations keep appearing. For example, we are informed that "Charisma as another symbol of unity decreased in importance in South Asia with the death of Ali Jinnah and Liaquat Ali Khan in Pakistan and D. S. Senanayake in Ceylon."[10] General Ayub Khan, for instance, can be called charismatic, in the Weberian sense. In spite of these limitations, these area studies provide useful summaries of political developments.

In addition, Coleman's concluding chapter makes it worthwhile to plough through masses of detail in the area chapters. Coleman has done a painstaking job of arriving at generalizations on the basis of evidence presented in the area chapters. After reviewing the 75 countries covered, he arrives at the following conclusions. All of these societies have modern as well as traditional components. Further, they lack political integration and finally, there is a wide gap between the masses and the elites. Coleman then concludes that six political consequences result from these types of political systems.

1. National politics are essentially urban politics.
2. The rural-urban gap is minimized by increasing contacts between the two sectors.
3. There is a rapid movement from rural areas to urban areas, thus

[9]Almond and Coleman, p. 59.
[10]Almond and Coleman, p. 244.

creating unemployment and a predisposition to anomic activity.

4. Industrialization and commercialization have not necessarily resulted in political integration.
5. Political modernity has not resulted in the ending of group tensions. In some cases it has resulted in renewed antagonism.
6. In spite of political secularization, religion continues to influence political behaviour.

Coleman then introduces a very suggestive hypothesis originally developed by Lipset that there is a correlation between economic development and political competitiveness. To begin with, Lipset's generalization has some serious limitations, in that he is describing economic *achievement* and not development, as development implies growth and Lipset does not measure growth. Coleman's suggestion that there is a positive correlation between party competitiveness and economic development has serious implications for future political developments in these areas. It is here that we have the most serious objections to the study in that it assumes that this competitiveness is practically synonymous with democracy. Ceylon, for example, enjoyed party democracy for a few years and would rate high on Coleman's list. Recent experiences since 1956, however, lead one to conclude that political democracy is something more than the mere existence of competing political parties. The Philippines also rate high in terms of external performance in the Coleman scheme, but as Heady warns us:

> This substantial parallelism in the legal governmental systems of the United States and the Philippines should not blind us to the operational differences in politics which affect the conduct of administration. For instance, the popular base for government is much smaller in the Philippines, because of the lower literacy rates, lesser education, greater political apathy, restrictions on individual political choice, manipulation of the election machinery, and so forth. Political parties are even less cohesive and less firmly identified with a political programme. The two-party system has been more a myth than a reality. Political groupings are highly personal in nature.[11]

Finally, students of Far Eastern politics will be disappointed not to find a discussion of Japan, but will be shocked to find China ignored. From a comparative point of view, the absence of China is almost unpardonable.[12]

While Almond and his associates attempt a taxonomy of political systems, Rupert Emerson, reflecting the historical orientation, seeks an answer to a specific problem. In looking for his answers, he seeks evidence from the social structure, the religious order and economic organization. As his sub-

[11] Ferrel Heady, "The Philippine Administrative System — A Fusion of East and West", in *Toward the Comparative Study of Public Administration*, Department of Government, Indiana University, 1957, p. 259.

[12] Shils, in a recent article, has developed some new categories for describing political systems. He divides them into the following: political democracy, tutelary democracy, modernizing oligarchy, traditional oligarchy and totalitarian oligarchy. Coleman does use some of these categories but unfortunately not all of them. If he had accepted all of Shils' categories then he could not have avoided discussing Communist China and Japan. The inclusion of China and Japan might have influenced his findings about economic development and party democracy.

title indicates, he is interested in the rise of self assertion of Asian and African peoples. Their self-assertion, he argues, arises out of their reaction to domination. Thus he begins by examining the nature and consequence of imperialism. It is quite refreshing to find an American scholar utilize the term in spite of its Marxist-Leninist connotations. He tries objectively to evaluate the role of imperialism, indicating both its positive and negative aspects. But his primary concern is not a moral denunciation but to examine imperialism as an instrument of change.

> Imperialism scattered the revolutionary seeds of Western civilization in haphazard fashion over the surface of the globe and started them on the first phases of their growth. Its most important result, ironically enough, was to rouse against itself the nationalisms — and in some instances even to create the nations — which worked to make its continuance impossible.[13]

One of the most important consequences of imperialism has been nationalism. Emerson's chapter on nationalism is an excellent treatment of the concept, especially its new meaning in the developing areas. He draws a distinction between state and nation, a distinction that might have clarified Almond's analysis greatly. The nation, according to Emerson,

> is today the largest community which, when the chips are down, effectively commands men's loyalty, overriding the claims both of the lesser communities within it and those which cut across it or potentially enfold it within a still greater society, reaching ultimately to mankind as a whole. In this sense the nation can be called a 'terminal community' with the implication that it is for present purposes the effective end of the road for man as a social animal, the end point of working solidarity between men.[14]

In discussing the state he says:

> Since the state is in modern time the most significant form of organization of men and embodies the greatest concentration of power, it is inevitable that there should have been, and should still be, a great and revolutionary struggle to secure a coincidence between state and nation. The nation seeks to take over the state as the political instrument through which it can protect and assert itself.[15]

Emerson recognizes both the integrative and disruptive functions of nationalism. Nationalism as a disruptive force is not often recognized by nationalist elites, in the developing areas.

Emerson then arrives at the following conclusions, which are very similar to those reached by Coleman. He recognizes the gap between the elites and masses. "Everywhere the gap between the mass of the peasantry and the dominant Westernized few continues to be immense, and must surely be narrowed as time goes by."[16] He is aware that these societies lack political integration and that their economies are of a mixed character. He also concludes, as does Almond, that quantification in the study of politics is not only necessary but unavoidable!!

As was indicated at the outset of this discussion, although the language of these two studies varied, their substance and conclusions were quite similar. Both of them are significant in that they have brought insight and

[13]Emerson, p. 20.
[14]Emerson, p. 96.
[15]Emerson, p. 96.
[16]Emerson, p. 366.

understanding to a very complex area. Almond and associates have exploded the myth that non-western political systems are mysterious and that they are not subject to empirical analysis. Emerson has brought many years of study to the area, and has presented his insights in a cogent and concise manner. Both deserve to be carefully read by all students of politics in the developing areas.

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BOOK REVIEWS

Report of the Commission of Enquiry into the Natural Resources and Population Trends of the Colony of Fiji, 1959. Published by Crown Agents for Oversea Governments and Administrations, Council Paper No. 1 of 1960.

The Commission names a high rate of population increase as one of the main problems of the islands and the members state that even if their most far-reaching suggestions are accepted it will be difficult to maintain the existing standard of living (the *per capita* income is approximately £F70 per annum and has not changed greatly during the last decade.)

Fiji cannot be considered over-populated in comparison with many other countries at similar stages of development, and some might see in the expanding population a new opportunity to exploit unused land and other natural resources. As the Commission itself states:

> An interesting comparison can be drawn between Viti Levu, the largest island of the group and Jamaica, the largest of the British West Indies. They are nearly equal in area, Viti Levu 4,011 sq. Miles; Jamaica 4,411 sq. miles. They are about the same distance from the equator. The centre of both islands is very mountainous, and Sir Frank Stockdale, formerly Agricutural Adviser to the Secretary of State for the Colonies, said that parts of the broken country of Vita Levu very markedly resemble the "Cockpit Country" of Jamaica. Both islands are liable to tropical hurricanes. Both produce sugar, bananas and copra. With all these similarities the difference in population in 1958 was srtiking – the population of Jamaica was over one and a half million, while that of Vita Levu was less than a quarter of a million.

The population of Fiji is multi-racial. In 1958 East Indians accounted for 49 per cent of the population, Fijians 42.8 per cent. The smaller groups include Europeans, part-Europeans, Chinese, and other Pacific Islanders. Many of the problems facing the economic development of Fiji are recognized as lying in the rigidity of the Fijian system of living which is basically tribal, the chiefs exercising relatively strong traditional powers, many of which have been given legal sanction by the administration. It is perhaps difficult for people who live in the West Indies to realize that the two main races in Fiji – the Indians and the Fijians – have little social contact, and in general are engaged in different economic pursuits; each group has its own language, dress and customs, and intermarriage is practically unknown. Economically the Indian is an individual whilst the Fijian is dependent on his group or community, and in spite of a certain amount of restiveness amongst more enterprising Fijians there are psychological barriers as well as economic and traditional ones which prevent the Fijians from taking an acquisitive approach to economic advance.

Acquisition of material goods by individuals has not been part of the Fijian tradition and even today a man wishing to work for wages must obtain permission (not always freely given) from his chief. He must pay

part of his wages to his community and if, on his return, he has acquired goods such as a watch, bicycle or other property, it is likely that he will be forced by custom to give these up to relatives. Thus there is little incentive to work.

Fiji was ceded to the British Crown by the Fijian chiefs under the Deed of Cession, 1874. Under this agreement all land not already alienated by Fijians was to remain their property and was non-alienable. The alienated land was that which had already been bought, swindled or forced from the Fijian chiefs by early settlers and was to be recognized as private and freehold. This land included extensive sugar plantations in Viti Levu and Vanua Levu and coconut plantations in numerous outer islands.

The Indians were brought to Fiji from about 1880, under a similar indenture system to that in Trinidad and British Guiana and continued up to 1916. The fact that Indian immigration to Fiji was rather later than in the B.W.I. may account in part for the fact that in Fiji, Indians have retained their traditional language, religion and dress to a much greater degree than they have in the West Indies, (although there are, no doubt, other factors to account for the more thorough racial assimilation in the West Indies). Indians were at first employed as wage earners on the estates in Fiji but in 1916, a drastic change in organization was started and now the Indians are tenant farmers renting the land from the estates, which are all owned by one Company. This Company also mills the sugar, the tenants selling their cane to the Company's mill and following cultivation practices as directed by the Company. Although fairly good cultivation practices are ensured by this system, it is doubtful whether the East Indian farmer is as much a "free man" as he would be under a pure wage-earning system. The number of would-be tenants exceeds the farms available and a man has much to lose if he does not follow the Company's directions.

The Indians thus own virtually no land, although many of them have acquired long leases from the sugar Company and in some cases from Fijian communities who have been permitted to lease certain lands. There is thus excessive land-hunger amongst the Indians, and although relations between the two races are on the surface good, there is an underlying fear (which may possibly be exaggerated by "neutral" observers) on the part of the Fijian that the Indians are only waiting for the opportunity to seize Fijian land. This partly accounts for the reluctance by Fijians to face up to responsibilities in an age in which self-government should be one of the main concerns of dependent territories, and there is little doubt that some leading Fijians believe that if the British Administration were to go, their privileges would be threatened.

Representation in the Legislative Council is on racial lines. Indians have certain elected members, and certain Fijian chiefs represent their race. In addition there are the usual ex-officio and nominated members who may be of various races but still display a large European component.

In its Fijian administration, Fiji has a very powerful and complex system of local government. This administration handles nearly all problems concerning the Fijian people and acts mainly through the chiefs. It has given strong legal sanction to the system of chiefly rule found in old Fiji and it may not be too sweeping to say that the utilization of this system by the British administration may have strengthened it and prevented an evolution which might otherwise have taken place in response to changing economic and social conditions.

The Commission has made a number of far reaching and – by Fiji standards – revolutionary recommendations, (page 125) ranging from such minor details as: (42) "The Fijian Development Board Fund should stimulate expenditure on hot air driers (copra)rather than housing" to such broad far-reaching statements as: (5) "The Fijian should enjoy as much personal liberty as any other British subject." Whilst recognizing the Fijians rights to their land, the Commission sets out proposals for making better leasing conditions available to others, and for enabling Fijians to run farms as private individuals rather than as members of a community. The Commission also recommends that the Fijian administration be replaced gradually by a proper system of local government in which races would be represented on a population basis, and that elected Fijians, not necessarily chiefs, sit in the Legislative Council.

On the economic side the Commission recommends that a rather more imaginative programme of capital grants to Fiji be brought into operation, although it is noted that these recommendations are based on an intensification of the present Development and Welfare type of programme rather than constituting any change in approach.

It may not have been in the terms of reference of the Commission to ask – What is to become of Fiji? Is Fiji to become a self-governing state or part of a federation or to remain forever a Crown Colony? Similarly it may not have been on the programme for the Commission to pose such problems as relate to the continued existence of a state run on racial electoral divisions in a modern world in which such institutions appear to many to be backward, and incompatible with modern aspirations. No actual attack is made by the Commission on segregated education, although this is perhaps implied in the recommendations that: (112) "government should refuse financial assistance to any school opening in an area already adequately served by another school," and: (113) "English should be taught from the beginning of a child's school life." At the same time the Commission notes "the Colony cannot afford at present to increase expenditure on higher standards of general education."

It is a favourite maxim in Fiji that racial harmony exists because each race keeps to itself and there is little economic competition; it is claimed that efforts to integrate Fijians and Indians into one community would lead to

racial strife. Whilst it is true that any attempts to force sudden changes might be dangerous, it is unfortunate that what is conspicuously lacking amongst the people themselves is a sense of "Fiji nationalism" which would inspire a common interest rising above racial groupings and leading the people towards responsible self-determination. It of course goes without saying that the official mind is not conscious of the need for such a movement; hence the rather unimaginative attitude to education and representation. In the minds of the majority of officials leaders in Fiji today, a political system cutting across racial boundaries has no place in the economy, and yet if a popular political party were to be started, with independence as its goal and a truly representative following, it would undoubtedly encourage the administration into thinking along modern and more optimistic lines. One of the main problems of Fiji is its lack of contact with the outside world, which has tended to retard the emergence of leaders of vision, and another is its dependence on an expatriate administration, which, not being specially concerned with changing things, tends to accept the *status quo*.

One of the recommendations of the Commission is that:(114) "a group of Fijian students should be sent to a United Kingdom university under supervision". My recommendation would be that a group of Fiji (Indian and Fijian) students should be sent to the University College of the West Indies — not under special supervision — but with sufficient funds to enable them to travel a little in the West Indies and observe the emergence of an integrated multi-racial state. They should also be encouraged to take jobs during vacations and perhaps work for a year or two after graduation with West Indian governments or business firms.

A further suggestion — and this applies not only to Fiji but to other colonies which are experiencing difficulty in reaching the political "take off" stage — is that a group of civil servants from countries such as the West Indies and West Africa, where a well qualified local civil service exists, should be lent to, or exchanged with, colonies which are more backward. The experience of these civil servants would be invaluable in steering a country to nationhood and it would perhaps destroy the myth — unfortunately all too current in the Pacific — that the higher offices of government are for chiefs and white men only.

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A Report on an Evaluation of the Farm Development Scheme. By G. J. Kruijer and A. Nuis, Government Printer, Kingston, Jamaica, 1960.

Jamaica is to be congratulated on its vigorous efforts to develop agriculture; it is to be doubly congratulated on the generally good documentation of the results of these efforts. For instance, the annual reports of its Agricultural

Development Corporation are always up-to-date, factual and critical; the publication under review is an evaluation of the Farm Development Scheme by two foreign sociologists. So often the world is deafened by the fanfare that heralds the inception of such schemes but subsequently hears nothing of the progress, results or difficulties. We rarely can profit by the mistakes and miscalculations of others in this most difficult field of planned agricultural development because we hear nothing of them. Not so with Jamaica.

The evaluators have outlined the origin and subsequent objectives of this Development Scheme, they have reported on its progress both in financial and more qualitative terms. Although they are both sociologists by profession and express their need for an agricultural economist, they make many shrewd observations that should further the economic objectives of the Scheme. They keep refreshingly aloof from the sentimentality that so often surrounds the problems of small farmers.

The authors rightly emphasise the contrast between the original and the revised policy of the scheme – from total development of individual farms in pilot areas to assistance on specific items for all farmers. The change was prompted by many farmers in the pilot areas not availing themselves of the scheme while many outside them clamoured for at least some sort of assistance. The evaluators, without necessarily condemning the change of policy, questioned the influence of the factors that prompted it.

Whatever the initial and subsequent intentions, the programme has turned out to be virtually a pasture improvement scheme. The evaluators note the large accumulation of commitments, (about three times the expenditure to date,) much of which appears to them to be tentative and unlikely to materialise in actual improvements in the field. The type of improvements with proportionately high commitments are understandably those which have not proved very popular in terms of actual expenditure, – afforestation, farm buildings, permanent crops and cocoa special assistance.

The most pertinent and thought-provoking sections of the evaluation deal with the reluctance of some farmers to avail themselves of certain types of assistance or to implement a whole farm plan that includes many such items; alternatively to carry out types of improvement, (such as soil conservation and improvement to buildings,) but thereafter not to use or maintain them. The evaluators single out the small farmers as the most common culprits in these respects but sympathetically and correctly, in the reviewer's opinion, enumerate the causes of these defects. The evaluators conclude that farmers with less than 20 acres, more or less, are not suitable for the efficient use of public funds for such a development scheme.

The evaluators evidently did not consider it within their province to carry these observations further. They have made no mention of the fact that 90 per cent of the Jamaican farmers have less than 25 acres of land and the scheme therefore is likely to be really applicable to no more than 10 to 15 per cent. How to treat the remainder? This is the great problem of

West Indian agriculture; indeed, often greater than the technical and scientific problems of improving production.

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Natural Resources in Low Income Countries: An Analytical Survey of Socio-Economic Research. By Jaleel Ahmad. University of Pittsburgh Press, 1960. 188 and xxv pp. $2.50.

The major portion of this work is an annotated bibliography of some 500 reports and monographs dealing with resources and resource use in the "low-income countries" of the world, that is, most of Asia, Africa, Latin America, and Southern Europe. These items, all dated after 1947, are collected together under the following heads: Natural Resources in general; Land and Water (10 sub-heads); Energy (5 sub-heads); and Minerals (3 sub-heads). There is a geographic index.

The bibliography is not meant to be comprehensive; unfortunately it fails even to be representative. Almost all the reports selected were prepared by agencies of the United Nations, the World Bank, the United States International Co-operation Administration, and other international organizations; the work of local governments is represented by few items, and most of these are out of date.

One who seeks a general picture of the resource situation in any country would fail to find it here. Nor could one learn anything about the relative importance of particular resources in the economy. For the West Indies as a whole, for example, there are no references at all; there are none for Trinidad, five for British Guiana, and six for Jamaica. The six Jamaican items are the World Bank Report (1952), four brief reports on soil and water conservation and flood control by the F. A. O. and the U. N. Technical Assistance Administration (1953-56), and one a 10-page 1954 F. A. O. report on fisheries! Nothing on bauxite, nothing on gypsum, nothing on electric power, nothing on agriculture or land tenure, nothing on the Land Authorities, nothing on the work of the last few years in irrigation and water supply development, no reference to studies of Jamaican resources by the Geological Survey Department, nothing on the socio-economic aspects of resource development.

The annotations were designed "to present in concise form the more fundamental problems and issues that formed the subject matter of individual studies...[and] to indicate the concepts, approaches, and methodology...employed"; but they are more often pedestrian and superficial. Of the World Bank Report on Jamaica, the appraisal here concludes: "The development program has been properly interrelated by including consideration of social services such as health, education, and public administration." This has a curiously archaic ring, especially by contrast with Simon Rottenberg's comment, as long ago as 1953, that the Bank Report en-

tirely ignored the most fundamental factors in Jamaican culture and society bearing on resource use and allocation: "these are some of the really important questions; the reader of the report will look in vain even for their formulation." (Entrepreneurship and Economic Progress in Jamaica, *Inter-American Economic Affairs*, Vol. 7, pp. 74-79).

In a brief introductory analysis of the content and quality of the reports surveyed, the author and his Project Director, Milton J. Esman, conclude that most studies of resources in under-developed countries are physical, technological, or engineering in character, deal with specific commodities or projects, are descriptive rather than analytical, and generally neglect questions of economic availability and rational utilization, policy and planning. A broader, interdisciplinary approach and a recognition of the significance of non-economic factors are here advocated, and writers of reports are urged to substitute "synthesis" for "technical elaboration."

However laudable these aims may be, they are not likely to be advanced by this presentation of them, based as it is on the shallowest interpretation of materials so selected that the conclusions reached are foregone. "It is worthwhile to realize," claim the authors (who prefer "interdisciplinary treatment" to "precision"), "that the most important decisions in life do not require specialized study." That dictum is the ruin of this work.

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